American Aviation

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FORTNIGHTLY REVIEW

Better Outlook

THE pessimism which characterized much of the position of U. S. airpower in the war a month and more ago has partially lifted. A few signs that might be called definitely encouraging have appeared and perhaps there are enough of these signs to warrant at this time a brief review of current trends.

1. *Recognition.* Sixty days ago, airpower was still being sidetracked in Washington. It was considered important, to be sure, but not *all important.* In a manner of speaking, it had only a yellow light instead of a green one. Today there are indications that airpower is for the first time beginning to get the recognition it needs on topside. The idea that airpower must precede the launching of land fronts, and that we must have superiority of airpower regardless of anything else, is finally breaking through the heavy mist of Gettysburg battle strategies that has dominated our military thinking. There is a definite *swing* in this direction. The mere fact that the trend is now in that direction on topside is gratifying.

Contributing factors to this swing are many. Perhaps uppermost was the Dieppe raid with its heavy losses and actual demonstration of the hazards of prematurely-launched land fighting. Another factor is the continuous performance of the

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Record of U. S. Planes on World Battlefronts Lauded by OWI

Aero Chamber Future Vague As 5 Western Firms Resign

WITH five members having submitted resignations and other important members indicating they would follow suit, the Aeronautical Chamber of Commerce faced a fight for existence following a special executive committee meeting Oct. 22. Action on the destiny of the Chamber for the future was to have been taken at a special meeting of the board of governors Oct. 30.

What appeared to be widespread dissatisfaction by large airframe manufacturers with the Chamber's policies and activities threatens to break up the organization which has been 100% representative of the aviation industry for several years.

First to submit resignations were North American Aviation, Inc., and Northrop Aircraft, Inc., whose notifications were received on Oct. 17. A few days later Consolidated Aircraft Corp. resigned, followed by Vultee Aircraft, Inc. Douglas Aircraft Co. also was resigning, although the letter had not arrived in Washington by the time of the executive committee meeting Oct. 22.

Other large companies, all airframe manufacturers, have indicated they would go along on withdrawals if the above five companies resigned. These include United Aircraft Corp., Curtiss-Wright Corp., Glenn L. Martin Co. and Boeing Aircraft Co.

Lockheed Aircraft Corp. was holding up its decision pending developments.

The executive committee tabled action on the resignations pending study of various proposals and action by the board of governors Oct. 30.

Three proposals were made and will be considered by the board and the membership. One of these proposals is for the complete dissolution of the Chamber. Another is to streamline the Chamber radically, eliminating some of its activities and reducing costs of operation, and providing for a greater voice by strictly airframe companies. The third proposal is for the airframe companies to withraw

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And Regular Features

Even Older Craft Still Excel in Some Theaters

By ROBERT H. WOOD

DESPITE unpreparedness on Dec. 7 in several Army and Navy types, our combat aircraft in the first 10 months of war have given the enemy stiff opposition under conditions their designers never expected them to meet, with the record the past two months probably too good to last as we penetrate enemy territory, the Office of War Information told the American people Oct. 19 in a 10,000 word report.

Intended to end the recent confusion in the press about the quality and efficiency of U. S. combat planes, the report is an attempt to present an expert, clearly-stated finding based on adequate evidence from Army, Navy, industry and competent individuals.

Although public opinion has swung from the belief that our planes are the best in the world in every category, to the opposite view that every other country has aerial superiority over us in all types, the report says the truth lies somewhere between these two extremes.

Furthermore, a balanced air

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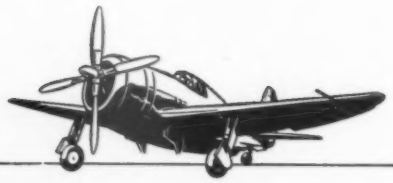
XUM

V OLUME FOR VICTORY



HERE IS A GLIMPSE . . .

No single photograph could show you *all* of the Republic P-47 Thunderbolts that are on the line at Farmingdale and at other points . . . Their thunder in the uppermost regions of strato-combat will contribute mightily to the crescendo of victory.

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Stimson Silences Knerr For Blast At Navy Seizure of Army Planes

By ROBERT H. WOOD

NAVY SECRETARY KNOX acknowledged under questioning during a press conference early in October that the Navy has changed its aircraft policy to provide for land-based planes and that it is acquiring four-engined Consolidated B-24s. These were planes ordered and wanted by the Army. He refused to answer another question as to whether North American B-25 medium bombers are also being taken from Army consignments.

The Secretary thus verified a lead story in AMERICAN AVIATION'S July 15 issue reporting the switch in Navy policy, and the resulting duel between the two services over the same planes.

Knox's statement came only a few days after Secretary of War Stimson ordered Col. Hugh J. Knerr, retired former chief of staff of the GHQ Air Force, to cease all comment on the conduct of the war, a move which aroused Army flying men and proponents of air power.

Knerr had declared in a statement Oct. 9, given publicity by the Associated Press, that "many" four-engined bombers, formerly a part of the Army's bomber program, are being diverted to the Navy, "which is muscling in on air power which has been developed by the Army."

The AMERICAN AVIATION story of July had also reported that at that time the Navy was making strenuous efforts to obtain landplanes which had long been on order by the Army, but up to that date the Army Air Forces had succeeded in keeping their planes, except for a small number of Douglas A-20s. Later it became known that the Navy failed completely to wrest any Flying Fortresses from the Army.

Under-Secretary Forrestal of the Navy also revealed before a Senate Appropriations Committee hearing that the Navy is purchasing "some" B-24s.

"The policy was established that the Navy would add land-based planes," Knox told an inquiring AMERICAN AVIATION reporter at his press conference. He added that the Navy is buying the B-24s because it needs them most, but that he saw no reason for a limitation on types of landplanes which the Navy could acquire.

Chairman Vinson of the House Naval Affairs Committee commented tartly, when questioned, that the Navy "should have been using land-based planes all along." He said "A thousand Naval land-based planes should be at Guadalcanal right now." The Navy has "innumerable land bases and these should be adequately supplied with landplanes," Vinson said.

The Naval Affairs Committee in July pushed through a bill (H.R. 7419) authorizing $974,634,000 (including $399,494,000 for aviation facilities) for various public works to keep abreast of the Navy's augmented ship and aircraft program. Army flyers saw this bill as a tip off on the Navy's plans for landplanes, and knew they could come only from Army production since the Army had engaged virtually all landplane manufacturers.

In his last public statement before Stimson's order, Knerr said:

'Muscling In'

"The Navy is muscling in on air power which has been developed by Army experts, whereas in every case in the past the Navy has strangled the idea of dominant aircraft."

He said it was "disappointing" to see Admiral Thomas C. Hart, a member of the Navy's policy-making General Board (without a single airman member), write in a recent *Saturday Evening Post* that the Navy required "entire freedom to use landing fields."

"There is a connotation of danger in that the weapons of land-based aviation are being diverted from the Army Air Corps, where they were developed and are understood, to the Navy.

"In my opinion, the Navy command is in no position to operate land-based aviation in any theater of operations, and in short, all this smoke screen, such as the Hart articles, is nothing but propaganda arising from a desire to command."

Knerr, before he was squelched by Stimson, said the day of the battleship and aircraft carrier is gone and that Naval officers know that the chances are they will some day be left with nothing but "tugboats" to command.

"You cannot handle air power in the same manner you do surface ships," he said.

He believes there is need of an "autonomous" air arm as well as a "war industries agency", all tied into "one command" with the Army and Navy.

"We are going to continue to lose this war unless this is done," he said in his last frank statement, "because you can't beat a fellow like Hitler who has a dominant air force tied in closely with his ground forces and his production agencies."

Stimson's order, made public by Knerr, said:

"You are directed to refrain from all public addresses, written words, and all comments on the conduct of the war and questions relating to the tactical use and organizational relationship of the armed forces of the United States and her allies."

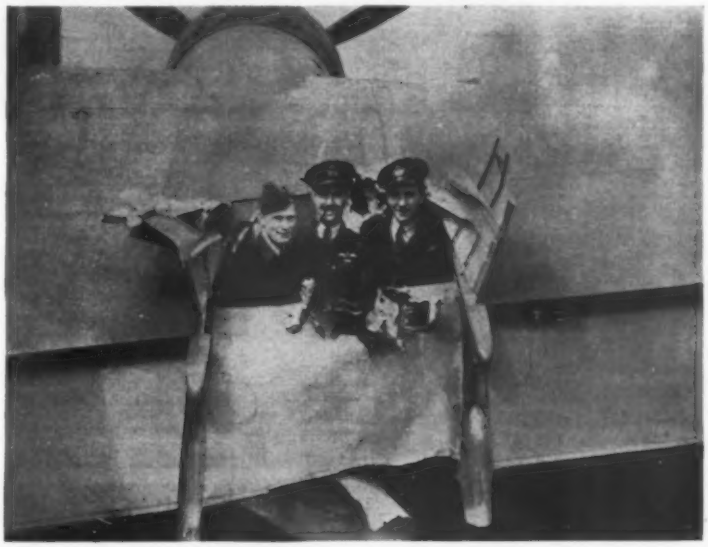
In canceling a Milwaukee speaking engagement Knerr wired: "My apologies for a policy that reserves freedom of expression to but one side of the question and denies true air power to the United States."

Army Air Forces officers and men were quick to denounce Stimson's action. It was the general consensus that the AAF, now fighting the enemy on nine battle fronts, and needing every plane desperately, is being penalized for a procurement policy which has turned out to be more far-sighted than that of the Navy, so long hide-bound in its aviation policies, and just now showing signs of giving its long-starved Bureau of Aeronautics a green light.

"Will Secretary Knox now similarly silence Admiral Hart?" it was asked in Washington. So far he has not, publicly, but it is doubted if the Admiral will make any further public outbursts. Navy officers admit Hart's articles were "a major mistake."

General attitude in Washington was expressed by Frank C. Waldrop, Foreign and Political Editor of the *Washington Times-Herald*, who called Stimson's action wrong. "Stimson isn't serving the American people by such a censorship. We are entitled to know, within the limits of military security. We are entitled to debate . . . We can be trusted. Whose war is this, anyhow?"

Knerr had written a series of articles in *American Mercury*, and had given press statements, frequently blasting "Navy brass hats" and Navy publicity methods. He was considered one of the few remaining outspoken proponents of air power. His last magazine article, in the current *Mercury*, was in print before Stimson silenced him.



Three Men in a Hole: A German anti-aircraft shell blasted a hole in this Lockheed Hudson's wing big enough for three men to stand in. Nevertheless, the plane flew back from the Dutch coast to England and made a perfect landing. British pilots call the Hudson "Old Boomerang"—it always comes back.

Maj. Gen. G. C. Kenney Named for Promotion

President Roosevelt on Oct. 15 nominated Maj. Gen. George C. Kenney, commander of U. S. Air Forces in Australia, for promotion to the temporary rank of lieutenant general.

His confirmation by the Senate will increase to four the number of lieutenant generals in the AAF. Others of the same rank are H. H. Arnold, commanding general, Delos Emmons and George Brett.

Gen. Kenney's service with the air forces dates from the last war when he enlisted as a private in the aviation section of the Signal Corps. He was awarded his commission and wings on Nov. 8, 1917, and during the war received the Distinguished Service Cross and the Silver Star.

Rated as a Command Pilot and a Combat Observer, Gen. Kenney has served the Air Forces in many capacities, including that of assistant to the Chief of Staff of the General Headquarters Air Force in charge of plans and training.

CAP Tax Deductions

Contributions made to CAP may be deducted as "contributions" from gross incomes for Federal income tax purposes, in the individual returns of donors. This is according to Section 23 (o) 1 of the Internal Revenue Code, explained in Internal Revenue Bulletin No. 35, issued Aug. 31. Such contributions may not be deducted in the returns of corporate donors. Similarly, expenses for gasoline used in civilian defense work, understood to cover CAP, may be deducted as "contributions". This was the effect of a recent opinion by the Commissioner of Internal Revenue, Guy T. Helvering.

XUM

Gallup, Lippmann Build Up Pressure To Use Airpower

The Gallup Poll, probably the most powerful single instrument of the American press in Washington, where its reports are scrutinized by government officials and members of Congress, is playing a major role in building up pressure on government and military leaders to give aviation the green light in this war.

"While military experts have debated the importance of airplanes in modern warfare, the man in the street has without exception voted with those who believe that airpower has not yet been given its full and rightful place in World War II," George Gallup wrote Oct. 18.

In the newest study the public was asked: "If there is a shortage of raw materials for manufacture of war goods, which branch of the service do you think should have first claim on materials—Army, Navy, or Air Force?"

Fifty-two per cent said the Air Force (of both Army and Navy); 11% said the Navy, 9% the Army, and 28% didn't know. Of those with definite opinions the result was : Air Force 72%; Navy 15%; Army 13%.

Early in September Gallup revealed that of those who had followed arguments for and against a separate air force, 57% favored it, 27% opposed it, and 16% were undecided. In March 1940 Gallup found the people not only asking for a bigger air force but were also willing to pay extra taxes to get it, and in 1939 the findings showed that the public favored a larger air force by the overwhelming majority of 91%. This compared with a vote of 80% who had favored a larger air force in 1935.

"When historians come to write the history of this war, one fact singled out as having utmost importance may be the public's persistent and long-time belief in airpower," Dr. Gallup writes. "If laymen were actually called upon to settle the question, airpower would be given far greater emphasis than it now receives."

Walter Lippmann, another observer who is studied in Washington, also is questioning whether airpower is getting its chance. "The argument about air power . . . is a controversy at the highest level of military thinking," he wrote Oct. 8, and "upon the issue hang some of the gravest of all questions of strategy and great politics."

"It is a significant fact that in all the discussion about unity of command on the West European front, the idea has never been examined of selecting an American air general or a British air marshal as generalissimo. Yet why should it not be examined . . . We ought, therefore, not to find it strange that the air force might use surface navies and ground forces to carry out its operation, and it might just be true that for the war we are fighting the airmen ought to be in the driver's seat . . . The chances that the best of the air generals and air marshals will understand armies and navies are at least as good as that admirals and generals will fully understand air power."

BEW Air Division Expands; Ferry Planes Bring Imports

Rising importance of Board of Economic Warfare's International Air Transport Division under Philip W. Amram is indicated by the latest expansion of the division, announced Oct. 16, to direct transportation of strategic materials by returning planes of the Air Transport Command of the Army, and the Naval Air Transport Service.

The division is expected to gain momentum throughout the war and is slated to have an important role in post-war reconstruction.

"The BEW learned there was available space on returning planes of China National Aviation Corp.," OWI announced, describing the latest BEW activity. "Contracts were quickly modified to provide for delivery of bristles, tungsten, silk and tin to airports in China, whence the materials were flown out in that order of priority.

"In eight weeks, 32 tons of bristles, 70 tons of silk, 47 tons of tin, and 70 tons of tungsten were moved from China to India. Later, 98 tons of tungsten were flown out in 10 days." Platinum worth $475,000 has been brought from the Persian Gulf area, and plans are being made to move balsa from Central America, various ores, quartz crystals, industrial diamonds and mica from South Africa, crude rubber from Brazil, and rubber seeds from Liberia for planting in this hemisphere.

This air freight service is being developed by Amram, Col. Robert H. Smith of the Air Transport Command, Col. Roy Ireland of air priorities and other Army and Navy officers, as well as aides of State Dept., Metals Reserve Co., Defense Supplies Corp. and WPB.

The International Air Transport Division, under BEW's Technical Branch, handles all matters relating to international air transportation which fall under BEW, according to an official ruling.

"It will act in an advisory capacity to the Board on all matters of this nature. It will be responsible for assembling and analyzing data on programs pertaining to the movement of critical materials by air to and from the U. S.

"It will maintain close contact with the State Dept., the air services of the War and Navy Depts., the aviation agencies of the Department of Commerce, the WPB and any other agencies of the government having an interest directly or indirectly in international air transportation.

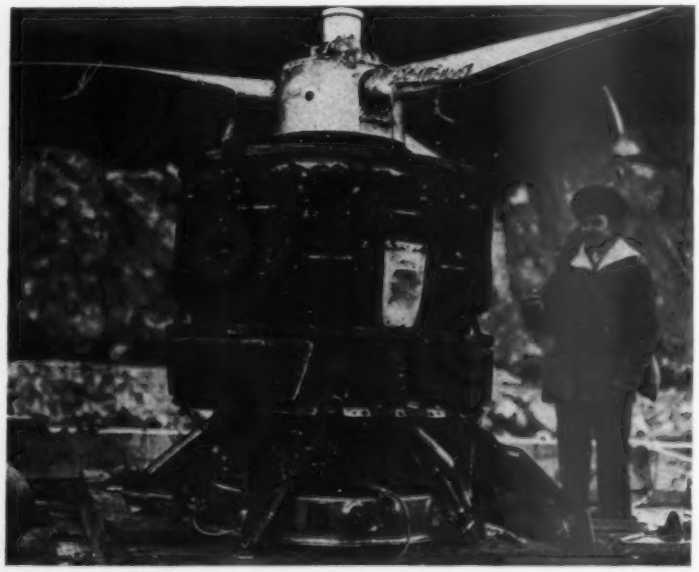
"It will maintain contact with representatives of air transportation and aircraft manufacturing concerns on problems relating to the work of the Division. It will be responsible for the formulation of plans for the development of international air transport and will make reports and recommendations to the Board on all such matters.

"Through close liaison with the Office of Imports, the Division will be responsible for all arrangements and handling of cargoes imported for the Office of Imports by air transport.

"It will make reports and recommendations to the Office of Imports on the purchase of strategic cargoes to be imported by air transport. The Division will advise the office of Imports with respect to problems arising from the transportation of export cargoes by air.

"It will furnish, either upon its own initiative or upon request, to the Office of Economic Warfare Analysis, all the strategic studies or other information relating to air matters of air transport nature that relate to all phases of economic warfare, including re-occupation and reconstruction, together with such reports and recommendations as would fall within this category."

The last paragraph is interpreted in Washington as paving the way for the Division to play a vital role in post-war international air transportation.



Big Jap Motor: This huge motor was taken from a carrier-based Jap plane which crashed in a mountainous section near Dutch Harbor, Alaska, during a bombing attack. The motor, in comparatively undamaged condition, is guarded by a U. S. Marine pending study by U. S. aeronautical experts.

British-Manned Hudsons Patrol Atlantic Coast

A squadron of Lockheed Hudson bombers, manned by British crews, is now operating off the American Atlantic coast, according to Lockheed Aircraft Corp.

The planes were flown from England, "reversing the normal eastward course of ferried aircraft" and "their British crews are helping American forces to make western Atlantic waters as dangerous for U-boats as the closely-watched shipping lanes on the European side," the announcement said.

It added that "more Hudsons have ferried the Atlantic eastward than all other types of aircraft combined —and now a squadron has been ferried west, so that British pilots may safeguard American shores."

Macauley Succeeds Gale

C. B. F. Macauley, managing editor of *Aviation*, has been appointed vice-president and treasurer of the Aviation Writers Association by Sloane Taylor, president. Macauley succeeds Charles Gale, former editor of *The Sportsman Pilot*, who is now in the public relations department of Fairchild Engine & Airplane Corp.

DPC Authorizations

Defense Plant Corp., subsidiary of RFC, has announced the following authorizations: Execution of a contract with Fairchild Engine and Airplane Corp., providing equipment in New York at a cost "in excess of $350,000"; contract with Northrop Aircraft, Inc., Hawthorne, Cal., providing "for the construction and equipment of a plant in California at a cost in excess of $2,500,000;" contract with Studebaker Corp., over $6,500,000, providing additional plant facilities for this firm in Illinois and Indiana. This brings to more than $70,000,000 total commitments to this company for such facilities. In each case, DFC retains title.

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Enemy Meets Stiff Opposition from Army

(Continued from page 1)

force is a requisite in modern aerial warfare. There can be no air force of pursuit planes, or all bombers, or all interceptors.

Going a step farther, the report hits indirectly at those who favor a separate air force, emphasizing that we must also have a balanced army. No campaigns in this war, it is asserted, have been won by tanks alone, or cavalry alone, or by any other single arm.

Although a report only of existing planes, OWI comments briefly on the future with the statement that the aircraft industry and the services are "developing highly specialized aircraft of high and in some cases sensational promise of battle performance," but demanding a brake on public enthusiasm until the test of combat has been passed by each model.

The Army's four-engined bombers "have proven superior in their categories in all theaters." Our medium and light bombers "are the best in the world and have been tested in all theaters." Our newest fighters of most promise have not been fully tried, but even our older fighters, unsuitable in England, have proven "splendid" weapons elsewhere, OWI says.

The Navy's latest carrier planes are superior in all types to those of other navies.

Our patrol bombers and cargo transports are at least equal to their foreign counterparts, and in some respects are definitely better.

Firepower and protection of U. S. planes are equal in all cases to the best our allies and the enemy have flying, and in some cases "decidedly superior."

A study of the complex air-cooled versus liquid-cooled engine question shows that the latter lost ground in past years that it has not yet regained, the main reason lying in technical difficulties preceding the recent perfection of the two-stage, two-speed supercharger for the Allison engine.

The supercharger will "vastly improve the performance of Allison-powered aircraft and progressively step up its horsepower as improvements continue." Since Pearl Harbor the Allison's horsepower output has been stepped up nearly 40%, although it is still about 100 H.P. under the British Rolls Royce. The Allison is "rapidly gaining ground," however, while its direct competitors, British and German, have come close to the maximum performance of which they are capable, OWI says.

The Wright and Pratt & Whitney air-cooled engines "are unequaled for horsepower output, ruggedness and altitude performance," although not specifically designed for fighters as was the new German B.M.W., in the Focke-Wulf 190, which for smaller planes has an advantage of compactness over other air-cooled models.

Grumman Wildcat

"Unquestionably the Best Carrier Fighter Now in Battle Service."

Innumerable other factors, written for the layman, involved in the design, production and use of our combat planes, are covered in the long report, which AMERICAN AVIATION publishes in full, as follows:

Design and Operation of United States Combat Aircraft

The people of the United States have a right to know, within those limits made necessary by military security, the strengths and weaknesses of their fighting men and fighting machines. It is their right to be informed and to debate these vital questions. But a degree of confusion has marked the public discussion of American combat aircraft. It has not been fully realized that the test of battle is the only valid one for an Army or Navy plane, whatever its type.

Failure of the public to appreciate this fact, and the additional one that there is no all-purpose plane, has bred doubt and discouragement. From believing their warplanes the best in the world, some people have swung to a conviction that British, German and Japanese planes are superior. Then, their hopes brightened by accounts of American air victories, they have gone back to their original optimism.

The truth lies between the two extremes. The public, delving into a field of great complexity, has had to base its judgment on what it read and heard. Some of its information, whether praising or damning American military aircraft, was obviously inexpert. A good deal was either superficial or based on inadequate evidence. Part of the confusion arose from the difficulties inherent in translating a highly technical subject into terms comprehensible to the average intelligent—but not technically trained—American citizen.

A Report on Existing American Planes

This report is not a study of air strategy or an inquiry into the future of aerial warfare—subjects to which the Office of War Information may at some future date return. The purpose of the report is to provide a background so that Americans can judge the capabilities and performances of United States combat aircraft.

Experts with varying degrees of ability have testified as accounts of victories and defeats in the air reached the United States. Generally speaking, the public could not form an adequate judgment because of over-simplification of one of the most complex subjects in all the complicated aspects of modern war: the design and operation of military aircraft. Sometimes the experts were unfair because they demanded the impossible. They forgot the peace-minded past of their country. They ignored the patent fact that we as a nation had been unwilling to spend the money for aircraft development which should have been spent in preparation for the day when the nation would be at war.

A Balanced Air Force the Goal

A balanced air force is the goal for which the United States and all the other warring powers, friendly or enemy, are aiming and have been aiming. To compare this with a balanced ground army is exact. No campaigns in the specialized war have been won by tanks alone or by cavalry or by any other arm. It is a military truism, with which the public now is abundantly familiar, that victory goes to the side with the best balance for a given situation, best employed.

Similarly, no war in the air will be won with an air force concentrated on the fighter, the bomber, or any other craft. The complete air force must be balanced. It needs fighters of various types capable of operating with maximum effectiveness through all the levels of air operation. It must have short-range fast-climbing interceptors for defense against enemy bombers, long-range heavily armed slugger types for the protection of its own bombers.

The complete air force needs bombers for best operation in all the specializations of that decisive activity; dive bombers for attacks on enemy (surface) craft, for cooperation with ground troops and for other purposes; torpedo planes for attacks on enemy shipping and warcraft. It calls for long-range reconnaissance craft, for light and medium bombers capable of a variety of work, especially low-altitude strafing. It needs transports for its service operations, aircraft for the taking and developing of pictures of enemy targets, planes for coastal patrol and offshore operations against enemy shipping.

No nation ever has attained this development in its fullness—although the United Nations in their combined air squadrons are close to it—because no group of military men conceivably could anticipate all the demands to be made by war. In reaching toward the ideal, the United States air forces also have been hamstrung in the past by disagreement in their own fighting services as to the weight and power to be wielded by air power. In spite of this, the United States went into the war with a well integrated air force; not all of it distributed with maximum effect. The versatility of many of our types, notably our heavy bombers, made it possible to use one class of aircraft for a variety of purposes, for example: the employment of modified bombers as transports. Yet it is characteristic of a great deal of the criticism leveled against United States planes that no consideration was taken of the concept of the balanced air force. Probably the same thing would have been true of German and Japanese critics, if they had been free to speak their minds.

Within recent months there has been a new type of appraisal of fighting aircraft which projected the known performances of a warcraft (the Boeing B-17 Flying Fortress) into the future. The verdict of this school, in which many United States newspaper writers joined, was that the Flying Fortress was unfit for combat over the battle fields of Europe.

Bombers in Combat

The test of battle completely disproves this. Actual employment of the B-

Rick Says It's An Air War Till We Smash Nazi Planes

THE European Western Front will remain an air theater until the Allies gain mastery over the Luftwaffe and crush the German aircraft industry, Capt. E. V. Rickenbacker, just back from England on an official inspection trip, reports to the Secretary of War.

The World War I ace and president of Eastern Air Lines told newspapermen in Washington Oct. 15, at Secretary Stimson's press conference, that American aircraft and airmen are proving themselves in action over France and other German-controlled territory, and are winning increasing approval from their former critics, the British.

Outright skepticism was evident in England when we began sending our Flying Fortresses and Consolidated heavy bombers with the expressed intention of carrying on daylight raids. The British also mistrusted some other of our equipment. But the tide has changed in the past few weeks and more and more of our aircraft are being sought. Beginning by the British of heavy daylight raids with their Lancaster bombers in the past fortnight reflects the impact of American ideas on a people who had found day bombing too costly with other tactics.

There are indications that the remarkable ability of our heavy bombers to hit targets from more than 20,000 feet have resulted in considerably heavier damage than would be expected from British night bombing.

It is also understood that high British government officials are being brought around rapidly to a new understanding of the potency of the heavy bomber.

At the press conference, Secretary Stimson distributed copies of an excerpt from Rickenbacker's report to the War Department on AAF personnel and equipment under actual combat conditions and in comparison with British and German planes and personnel.

Complete text of the public statement follows:

In England I had full opportunity to visit the various Bombardment and Fighter units of the American Air Forces, as well as to confer with the members of the high command of both British and American Air Forces.

My consensus is that American conceptions of Army aircraft and their tactical employment are proving sound in combat and that the British look upon the practical application of our air war theories with increasing approval.

The trend of the war on the western front is clearly one of air war and it is my opinion that the European theater

(Turn to page 23)

...and Navy Combat Aircraft, OWI Reports

...over Europe has exceeded even the fondest expectations of its American proponents. It has shown that the B-17 is capable of high-altitude day bombing of such precision that it astounded Allied observers. Combat has proved the great firepower of the Flying Fortress as well as its inherent toughness under enemy attack. This gave it decisive protection against enemy fighter attack, while its ability to operate at high altitudes cut down its vulnerability to anti-aircraft fire.

The public already is familiar with some of the B-17s feats, such as the recent fight over occupied Europe in which gunners in a flight of B-17s engaged 40 German fighters. Ten Focke-Wulfs were knocked down and eight more were claimed as "probables." All B-17s returned to their British bases, although one had been hit by six cannon shells and more than 200 machine-gun bullets.

In the October 10 raid over France—the largest and most damaging daylight raid ever staged over Europe—115 Flying Fortresses and Liberators accompanied by Allied fighters proved their ability to fight their way through to a target and back again against the large and fierce opposition of the Nazis' newest and best Messerschmitts and Focke-Wulfs. We lost only four of our bombers while more than 100 enemy planes were destroyed or damaged.

In the B-17s test in the European theater, there have been many other examples of the same kind of superlative performance. All of them follow the pattern of this plane's rugged, hard-hitting record in the Pacific. It is a tribute to the determination of the Army Air Forces in developing this type of craft that the same kind of record has been made by the Consolidated B-24 in Egypt and in other areas. Thus what applies to the B-17 applies in general to the work that the B-24 has done. In these airplanes the United States has weapons of marked and proven superiority in their fields.

The example of the United States' heavy bombers is cited to illustrate a basic principle in the appraisal of any combat airplane: peacetime capabilities can strongly indicate its qualities, but only operations in the field can prove them. Even then the trial of battle can prove them only in the field in which the record is made. The fighter that performs capably in the Southwest Pacific can turn out to be completely unsuitable for the defense of Britain; the bomber that is best for heavy night attacks on German industry can well be capable of no more than a second-class performance in the Solomons. On the vast pegboard of war the holes to be plugged are of a great variety of shapes. Only the pegs cut to their measure can fill them.

Aerial War on Many Fronts

For the United States, the requirements of this war are more varied than they are for any other combatant. Today aircraft of the Army Air Forces, for example, are in daily operation against the enemy on many fronts with variations in climate and battle situations that are the severest possible test of military aircraft. In the Aleutians, they are operating over water, in cold and forbidding weather, against Japanese establishments and aircraft. In the Solomons, operations are in stifling heat and drenching rains. In the desert, heat is compounded by swirling sand. In Australia and New Guinea a given aircraft in a single day may fly from subtropical temperatures to the chill of early spring. Operations continue, in these areas and in Europe, India, China, the Central Pacific. They go on in the Caribbean, off our own coasts, off the coast of South America. It is proof of the soundness of United States design and the versatility of American crews that they do go on, under conditions more varied and difficult than men and machines ever have had to meet before.

Grumman Avenger

"The Best Carrier-Based Torpedo Plane So Far Seen in Action in This War."

Some Planes Badly Designed

Some American warplanes are badly designed or ill-matched against the equipment of the enemy. Some planes now in action have definite deficiencies, even within the purposes for which they were designed, but even so such aircraft often have fought admirably, because of their positive virtues and inherent soundness, and despite such tactical handicaps as climate, inadequate air-raid warnings and other considerations of war. It also is a fact that some American aircraft have proved excellent in every theater in which they have been employed.

It is a truism that no military aircraft are perfect, even for their designed specialty. The measure of their excellence is relative; it is the score of their showing against the enemy. Since not every aircraft type has been tried yet in every theater—some because they are obviously unsuitable, some because they are not available yet in sufficient quantities—a full appraisal of their capabilities is not possible yet. It will not be possible until the war has been won, because, as it develops, new types and substantial modifications of old types will be thrown into action. But on the basis of 10 months of war, a fairly complete summary, subject to this limitation, can be made.

(1) The Navy went into the war with considerable quantities of aircraft that were not of the latest type, and unquestionably suffered losses that could have been avoided had the latest equipment been available. But secret battle reports which have been examined by the Office of War Information show that the latest floating-base aircraft of the Navy are, when compared plane for plane with the planes of other navies, superior in all types.

(2) In battle areas in the Pacific where it has had its most complete trial, Army flying equipment hardly can be said to have had a fair trial in the early days of the war. The disruption caused by the surprise Japanese attack and the necessity of retiring to bases inadequate to the technical demands of aircraft operation imposed conditions that no aircraft could meet fully. Yet in the Pacific area, as in China, the over-all battle score of Army aircraft has been much better than the enemy's. This is not to say that it could not have been better still. If the services had been more on the alert for Japanese treachery or had more accurately forecast the performance and tactics of Japanese aircraft, if they had predicted the possibility of early hostilities with Japan and had been in a position to make timely preparation for it, then the showing would have been immeasurably better. If the necessarily slow process of better types could have been speeded. United States aircraft in the Pacific, especially fighters, would have been better fit for their jobs. As it was, the country paid in blood and defeat for the determined blindness of its peaceful years. Even our bombers, performing superbly in retreat, could have done better if the past had given them a chance.

(3) In the vital European theater, our newest fighters have not been fully tried up to now. Yet appraisal of our older fighter types—the Bell P-39 and the Curtiss P-40—compels the conclusion that they are not right for operation under today's high-altitude tactics in England. Admitted deficiencies in their performance makes them unsuitable. Both are outclassed in the high-altitude field by the British Spitfire and the German Messerschmitt 109 and Focke-Wulf 190. But it is one of the apparent paradoxes of aircraft performance that the P-39 has proved a splendid weapon on the Russian and Aleutian fronts, and that the P-40 is a first-line fighter in Egypt, able to slug it out with the Messerschmitt 109 on substantially even terms. This is due to the peculiarities of the tactical situations in these theaters which will be discussed in more detail further on.

(4) Two newer fighter types, the twin-engined *Lockheed* P-38 (Lightning) and the single-engined *Republic* P-47 (Thunderbolt), are in production and show great promise as high-altitude pursuit planes. Yet the public should be warned (a) that neither plane is the complete answer to the fighter problem (probably no plane ever will be) and (b) that neither has been tested adequately in battle. Until they are, a complete judgment on their qualities must be withheld.

(5) The Army's four-motored bombers, as stated above, have proven superior in their categories in all theaters. The Consolidated B-24 (Liberator) recently has been fully tested in the European theater and its splendid performance there and in other areas (notably the Middle East) and its general characteristics, indicate that it will make a record parallel to that of the B-17 (Flying Fortress) wherever it is employed.

(6) United States medium and light bombers, part of the bombardment specialization peculiar to this country (as a result of its earlier preoccupation with defense of our shores only), are the best in the world. They have been tested in all theaters. United States scout bombers, product of the Navy's long-time development of this destructive art, also are without peers among single-engine dive bombers.

(7) The firepower and protection of United States fighting aircraft (guns, armor, and leakproof fuel tanks) are equal in all cases to the best our allies and the enemy have in the air, and in some cases are decidedly superior. In these necessities, brought forth by the war, United States aircraft were deficient when the war began in September, 1939, and continued deficient for months thereafter. Conduct of the war by the British provided us with an effective proving ground. Many lessons learned by the British and the elaboration of some of their practices, particularly for airplanes built to their order by the United States, served largely to remedy the deficiencies by December 7, 1941.

It should be of great satisfaction to the American public that when these deficiencies were remedied, the job was done with armor and with guns previously developed in the United States by Ordnance experts of both. Notable in these developments was the .50-caliber

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Criticism Irresponsible, Gen. Marshall Tells House

STRIKING out at critics of U. S. Army combat aircraft, Gen. George C. Marshall, Chief of Staff, in a letter to Chairman Cannon of the House Appropriations Committee, asserts that much criticism has been irresponsible, that it has ignored many factors in plane design and performance, and that careless statements have a disturbing effect on morale of our pilots.

The letter follows:

"I have your letter of September 21 requesting me to comment on the quality of our combat aircraft.

"It is not generally realized that there is no satisfactory all-purpose airplane and that no single design of fighter plane possesses the characteristics of a variety of enemy plane types. Aircraft are designed for specific functions, determined by the nature of their contemplated employment.

"The Spitfire was designed to fight over the British Isles and on short flights across the channel. It is, therefore, a light-weight plane, having a limited cooling device and a limited fuel capacity. The British bombers were built for night operations. Therefore, they have light armor and limited gun installations, giving them a large bomb-load capacity. Our Air Forces are planned to operate as balanced teams in continuous mass attacks against the enemy. We cannot localize for a particular theater. We are involved in the Aleutians, the Arctic Circle and the tropics and in England, Egypt, India and China. The typical balanced Air Force includes fighter teams, generally subdivided into three categories: P-39s and P-40s, designed for low and medium altitude fighting and for close cooperation with ground troops; fast climbing, high-altitude P-38 interceptors, and P-47 high-speed top-cover fighters, designed to support our offensive bombardment operations to the limit of fighter range.

"The P-47 is just now coming into quantity production. The P-39 and P-40 have already demonstrated their worth. Their combat records show a consistent fighting superiority over Japanese planes which is being increased as the experience level of our pilots improves. For the month of August a total of 75 enemy planes were destroyed against a loss of 15 of our ships. Our P-39s destroyed 19 enemy planes in combat, losing four. For the same period, P-40s destroyed 18 enemy planes, losing two. In the period from August 14 through September 14, P-39s destroyed 20 enemy planes in combat with a loss of five and the P-40s destroyed 14 enemy planes in combat, losing one.

"Public discussions of this subject have failed to recognize the merits of a good fighting plane as contrasted with a good flying plane. This has been particularly true concerning the Japanese Zero, which has excellent flying characteristics. It has an extremely rapid rate of climb and good ceiling and is highly maneu-

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machine gun, with its superior hitting power, range, and rate of fire, and the plane-borne cannon. In the latter field the United States' 37-millimeter gun is the heaviest piece of ordnance carried by any fighter in the world.

The Problem of Design

The designer about to build a new airplane type is, by rough analogy, in the position of a man with a fixed amount of money to be spent on a new and vital outfit of clothing. He has, say, $75 to spend, can use it all, but can get no more. Surveying his problem he considers the climate where the outfit will be worn, the nature of the work he is to do, whether in office or afield, the nature of the going he will encounter, whether on sidewalks, in mud or over stones, during the day or night. For a severe climate he needs the best overcoat he can buy. But if he buys the $60 overcoat which is the best protection against the cold, he will have to get along with a cheap suit, and without accessories for his ensemble. If most of his time is spent indoors he may want a $60 suit, but then his protection against the weather will be completely inadequate. So his purchases turn out to be compromises imposed by his funds. Either one of the elements is superior to all the rest, because of some specialized purpose, or all are below the standard he would attain otherwise.

Expendable Horsepower

The strait jacket of the aircraft designer is the horsepower he has available. Given 1,000 horsepower, he can spend the surplus remaining after he has used what he needs to get his airplane into the air. It is this surplus that makes primarily for rate of climb. But as he also is ordered by the purchaser, i.e. the armed services, to build greater range into his airplane, he must spend some of his surplus to carry the weight of a greater fuel load. If armor must be added, more surplus is spent. There are other expenditures for guns and ammunition and perhaps light bombs. When it finally flies in action, the plane, as all planes are, is a compromise. Lightly armed and armored, lightly built in its essential structure, it may climb with lightning speed, maneuver as nimbly as a swallow. But if it has been shortened of guns, it is a fighter of fancy footwork, without a killing punch. And if it is without protection for the pilot, if it is so lightly built that a burst of machine-gun fire will blast it apart, the plane is a fighter with a glass jaw, like the Japanese Zero. As a flying machine it is spectacular; as a fighting machine it is deficient.

If, on the other hand, the end product of the designer's work is heavily armed and armored and fitted with leak-proof tanks, the plane will have a slower rate of climb and will not be so maneuverable as the lighter aircraft. It will have to rely on its speed, its heavier punch, its ability to absorb punishment when it gets within range of its nimbler adversary. Such a fighter is the P-40, and such is the direction toward which all the major warring nations save Japan have tended.

The reasons why, on altitude, the American P-39 and P-40 are inferior to some comparable allied and enemy types are many: essential design, specialized purpose, armament, and armor are among them. But it is primarily due to another consideration that in its own specialized fighter class the P-40 has been demonstrably surpassed by comparable British and German planes.

This consideration is the quality as well as the quantity of the horsepower available to the designer. Two given engines may each develop 1,000 horsepower. One develops this output at 16,000 feet, let us say, and another at 20,000 feet. It is obvious that where it is of vital advantage to a fighter pilot to get on top of his adversary before attack, the engine with the 20,000-foot critical altitude ensures the better of two fighters designed for the same purpose. Up to ten or twelve thousand feet the planes may have the same performance, or the plane with the lower critical altitude may even be superior. But a fighter pilot would prefer the second to the first in any theater where altitude is a deciding consideration of battle.

Flying Fortress
"An Unequaled Combat Record"

Air-Cooled vs. Liquid-Cooled

This brings up the question of the air-cooled versus the liquid-cooled engine and a problem of profound technical complexity which is far from final solution. The only liquid-cooled engine of American design now in mass production and general military use is the Allison. This drives the P-38, the P-39, and the P-40. Its development was late in starting and was carried on under great difficulties. It has not yet caught up with its opposite numbers, Britain's Rolls-Royce (also being manufactured in this country) and Germany's Daimler-Benz.

All three engines are liquid-cooled. When the last war ended, the United States had a reasonably good liquid-cooled engine—the Liberty—and went on to the construction of better power plants, of this kind. Meanwhile, the development of the radial air-cooled engine had been taken up with great skill and determination. The new-type engine had an appeal for the United States public because of its dramatic accomplishments. These began with the Lindbergh flight to Paris in 1927.

The air-cooled engine, inherently reliable, sturdy, and light, went into airline equipment and into military bombers and fighters. Its future was assured because it enjoyed the subsidy of private and public enterprise. The result: United States air-cooled engines built by Wright and Pratt & Whitney are unequalled, for horsepower output, ruggedness and altitude performance, by any other nation's power plants of the same design. These engines were not, however, specifically developed for fighter planes, as was the new German B.M.W. (Bayerische Motor Werke) in the Focke-Wulf 190. For small fighter planes the B.M.W.'s compactness gives it a notable advantage over other air-cooled power plants.

The development of the liquid-cooled engine was all but dropped for a period of several years in the United States as a result of the ascendancy of the radial, air-cooled power plant. Although it seemed an ideal engine for single-seater fighters, both the armed services lost interest in it. The proponents of the engine found it first difficult, then impossible, to get from their superiors and from Congress the money needed to develop their project. Chief of these means of development was high-speed racing. The British, Germans, and Italians tested their liquid-cooled engine developments in the crucible of the Schneider Trophy race and other similar competitions. From these they learned invaluable lessons in design, which were tried in their turn in later competition. But the United States, after a bri career in racing, withdrew. For a peri of several years, development of t liquid-cooled engine was all but aba doned while the services concentrat on air-cooled engines.

The Navy worked exclusively with air cooled motors, until recently. Mean while the Army had finally gone ba to the development of the liquid-cool engine because of certain desirable a tributes, notably its adaptability streamlining in small combat aircra But precious time had been lost. Wh war emergency orders called on th makers of the Allison for quantity pr duction, the engine was not yet ready f its task. Suddenly recognized once agai as an essential power plant for the well balanced air force, the American liquid cooled had lost ground that it has n yet regained.

The Supercharger

An informative side light on th priceless value of time in engine (an aircraft) development may be a brie discussion of the chief reason for th Allison engine's failure to become a world leader as of today. The reason lies in the engine's supercharger, a com plicated device for furnishing air a sea-level pressure to an engine in th progressively rarefying atmosphere tha a plane meets as it climbs.

When the first modern Allison wa being manufactured for use in military planes, the minds of its makers and the Air Corps officers in charge of its de velopment were on the turbo-super charger. This is in effect a rotary air pump, separate from the engine but driven by its exhaust gases, which fur nishes sea-level pressures to the carbure tion system far beyond the range of the integral supercharger. An exclusively American development, it promised great high altitude performance for United States airplanes. It has lived up to its promise in bombers and in the larger of the fighters, as will be discussed later. But in the smaller fighters which the Allison was to power, its incorporation in the design of the airplane proved, for that day, impossible. Technical difficulties, which could not be fully re alized until it was tried in the air, blocked its use.

Thus time was lost—an experience more or less typical in aeronautical de sign the world over. Meantime, less work had been done on the Allison's own self-contained supercharger than would have been done if its users and makers had realized they would have to depend on it, and it alone. When de velopment was resumed, the Allison was still further behind the parade.

Now, however, a two-stage, two-speed supercharger has been developed and thoroughly tested. This is an elabora tion which in effect gives the pilot a high gear for his supercharger when his airplane has climbed beyond the best limits of his low-speed blower. Allison's power plants with this super charger, regarded by the Air Forces as completely tested and proved, now are being manufactured and flown and will shortly be in quantity production. They will vastly improve the performance of Allison-power aircraft and progressively step up its horsepower as improvements continue.

With the turbo-supercharger installed notably in the big two-engined Lock heed P-38, the Allison engine lately has given a splendid service performance after months of tests during which all kinds of "bugs" developed and were eliminated, as was to be expected in a design which was new and unconven tional. The result appears to be one o

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From the Nation's Press

HE'LL PUT WINGS ON IT, OLD BOY, AND KEEP ITS TRADITION-FLYING!
NATIONAL SCRAP COLLECTION DRIVE
STOP, STOP, YOU ARE SINKING OUR PET TRADITION !

Boston Post.
Giving It the Air.

Pittsburgh Post-Gazette.
His Latest Nightmare.

XUM

Watch Alaska!

It seems only yesterday that dog teams took days to cover territory Alaska Star planes now fly in a few hours.

AT no time in the history of the Territory of Alaska has there been so much bristling activity as in the past eighteen months. Today, a vital stronghold in our all-out war effort . . . tomorrow, a land of untold opportunity for aggressive post-war development.

Keeping pace with present day air traffic requirements and gearing up for the passenger, mail, express and freight transportation needs of the morrow, ALASKA STAR AIRLINES has vastly increased its facilities—adding eight airplanes to its fleet; two new ground radio communication stations; a new, completely equipped, major overhaul station at Anchorage.

ALASKA STAR AIRLINES, having recently acquired the operation and equipment of Mirow Air Service, has extended the Nome-Anchorage run 600 miles southeastward to Juneau. A new passenger, mail route has been established between Fairbanks and Kodiak, with daily service to Anchorage, and scheduled service inaugurated between Nome and Fairbanks.

Today, ALASKA STAR activities are confined largely to essential military requirements, providing the most comprehensive transportation facilities available in the Alaskan Territory. At this time, ASA's fleet of 24 radio equipped transports maintains scheduled runs between 21 key cities, from which points 53 additional important destinations are quickly accessible via frequent ALASKA STAR operated non-schedule connecting flights. ASA is building today for a brighter tomorrow. *Watch Alaska—grow!*

For schedules, rates and other information consult The Official Aviation Guide

ALASKA STAR
AIRLINES

SERVING THE TOP OF THE WORLD

ALASKA STAR AIRLINES

Text of OWI Report on U.S. Planes

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the best high-altitude, long-range fighters in the world. But the public is cautioned once again to remember that it has not yet been tested in combat, and cannot be considered fully proved until it has.

Today, as we have said, the Allison engine after three years of wide service in the United States Army Air Forces still is a substantial jump behind its opposite numbers in the British and German air arms for altitude performance. Yet it is already a vastly better engine than many of its critics have made it out; few if any other liquid-cooled power plants are as rugged or as responsive to field maintenance. Since Pearl Harbor its horsepower output has been stepped up close to 40 per cent, due to the research work done on the engine in the two or three years preceding our entrance into the war.

The British Rolls-Royce engine has improved at a parallel rate and still tops the Allison's horsepower output by close to 100 horses, so precious to a plane's rate of climb and altitude performance. But, with the turbo-supercharger, the Allison is rapidly gaining ground, while its direct competitors, British and German, are judged to have come close to the maximum performance of which they are capable.

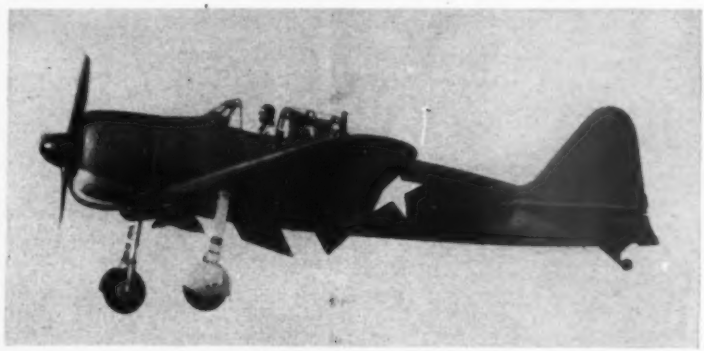
In the liquid-cooled field, both services, with war emergency funds at their disposal, have actively encouraged and participated in the design of engines made by other manufacturers. Several of them show promise of excellent performance. Their tests in aircraft, which cannot be greatly foreshortened by any device known to science, will determine their suitability for use in battle aircraft. They are mentioned only to show that the development of the liquid-cooled engine in this country is fully alive again.

Thus, in the course of time, neglect in the United States of an essential power plant will have been made up. Such neglect is not unique, in the United States or in other countries. The British and Germans, in their need of fighter craft, stressed the liquid-cooled engine. It was not until a few months ago that the Germans brought out their first air-cooled first-line fighter, the Focke-Wulf 190. This German development illustrates, again, how difficult is the question of deciding upon either air or liquid-cooled engines. The Navy's tried and tested Grumman F-4-F has an air-cooled power plant and so does the Army's promising P-47, although our allies still have no first-line fighter with this engine.

Aeronautical Design Slow

The basic specifications for United States aircraft now flying in combat areas were laid down five years or more ago, an indication of the slow process of aeronautical design in peacetime. Military and naval men were faced with a problem that the officers of many other major nations did not have to meet; they could not with any accuracy predict where the airplanes they were to build were to fight. Germany had a definite plan for employment of its aricraft then under test. So did Japan. So, for different reasons, did the designers of England. A striking proof of their conviction is the Spitfire, a splendid fighter admirable in all respects for the defense of France and, as it later proved, of England itself.

The prime specification for United States airplanes was that they would defend our shores. This, more than any other factor, explains our preoccupation with long-range bombers, designed to fly high, fast, and far, to meet the enemy far from our soil and turn him back. We did not expect the enemy to reach us, or to fight him over his own territory. This partially explains our



Captured Jap Zero

U. S. Effectiveness Against Them Improves

failure to develop, in time for the war's opening, a good interceptor, capable of climbing rapidly on short notice and intercepting enemy bombers. Our entry into the war without such an invaluable piece of equipment can be explained only by failure to give due consideration to the possibility of full American participation in aerial warfare overseas. Subsidiary explanations are shortage of development funds in peacetime years, the failure of a pivotal power plant (discussed above) to measure up to expectations, and the prevalent faith of the public that the country could avoid involvement in a foreign war.

In the vast revision of ideas of design after the war began in Europe, the United States owes a vast debt to the allies, particularly to the British, and to the lessons they brought to America from the battlefield. Beyond their large orders for aircraft and accessories, which forced the building of substantial production facilities, the British also underlined the necessity for substantial changes in design and armament and dramatized their necessity by ordering the changes on their American-built aircraft. Notable among them are substantially heavier armor, a great increase in firepower, and the adoption, for bombers, of the power turret.

These improvements, already available because of American technical developments mentioned before, were on most of our aircraft and on all warcraft coming off the production lines when Pearl Harbor was attacked. One effect of the changes on our fighters, however, was that it loaded them down more than ever, gave them more protection and power, but deprived them of nimbleness. It is illustrative of the fluidity of aircraft design that many United States fighter pilots now believe that the armor on their craft should be lightened and that they should have fewer guns.

Change is continuous. First the German, with his genius for speed and heavy hitting power, turned United States design into new channels with the accent on firepower and protection at the expense of nimbleness and rate of climb. Next the Japanese, who had developed his fighter craft in an opposite direction, set up a demand for the highly maneuverable, fast-climbing pursuit plane.

The Influence of the Tactical Situation

In public discussion of the performance of United States aircraft in this war, little notice has been taken of the effects of the battle situations into which they were thrown. The point already has been made that few if any designers of American airplanes envisaged, or were either asked or permitted to design for, a war in which United States aircraft would be called upon to defend Britain, or that bombers would have to be operated in short range missions against objectives that once were Dutch, Belgian, and French. Thus the fast-climbing interceptor aircraft was almost completely neglected, and bombers were designed to carry medium loads over long distances rather than great loads over short distances.

Fortunately, the British were working toward the ends which we had neglected because items of great importance in their defense were of minor importance in ours, as it was then conceived. The result is that the United Nations now have a fairly adequate selection of aircraft of all types. But it is not, nor is it likely to be, superior to the enemy in all categories. The best that the public can expect, and the best it will get, is that *on average* the equipment of the allied air forces shall be superior to the equipment of the enemy.

The effect of the tactical situation on the performance of aircraft operation is most strikingly demonstrated in the performance of P-40 fighters in the losing battle that began with the attack by the Japanese on the Philippines and ranged down through the South Pacific, through defeat after crushing defeat until at last a stand was made in Australia and southern New Guinea. Through the bitter days of the battle in Java, and the first weeks of the fight in Australia, P-40s performance was decidedly less than standard for its own capabilities. The odds against any other record were overwhelming. One reason was that many of the pilots in the area of retreat were new and untried and that they faced veteran airmen. But a more decisive reason was the fact that in retreat the loser progressively is deprived of the installations vital for sucessful combat operation. Operations were from makeshift fields. Repair and overhauling facitities were at a completely indaquate minimum.

Inadequate Air-Raid Warnings

Most disastrous of all was the complete lack of air-raid warning systems. In the Philippines the system carefully set up was disrupted by fifth-column agents before it had once functioned. As the battle wore south there was often none at all. Furthermore, our fighter pilots were without the technical equipment—detectors, etc.—to prepare themselves for the approach of the enemy. The result was that in many raids the first notice came when the enemy's planes were sighted. If our fighters were already in the air they had a fair chance of getting up and doing battle with the enemy or, as happened more often, of waiting for the enemy pursuit to co down to them and then slugging it o With this great deficiency in the pre aration for air war, no pursuit airpla ever built could completely have ove come it. It is too late to start a climb victory when the bombers are overhea Undoubtedly the P-40s could have giv a better account of themselves if th had had a higher rate of climb and ad quate warning system or a better al tude performance. On the other han our losses in men and planes wou have been far greater had they n been equipped with their heavy pr tective armament and high firepower.

How such equipment can be well em ployed with adequate warning servi was illustrated by Brigadier Gener Clair Chennault's A.V.G. flyers in Chi Buttressed by one of the finest ai raid warning systems in the world, h pilots scored the destruction of 2 Japanese planes, including many Zero while losing only 54 of their own. (The personnel losses were much lower be cause of the protective values of th P-40.) The score was made by P-4 of an older type than the planes now i service. A.V.G.'s successor, the presi pursuit group of the Army Air Forc in China, likewise under command o General Chennault, is making a recor that is at least as good in every parti cular. It must be repeated that all th credit does not go to the pilots nor t the planes: a great part of it is du to the warning system.

The other side of the picture is show by the destructive Japanese raid on Por Darwin, Australia, in February, 194 The first notice our limited numbe of pursuit pilots had that the raid wa on was the sight of the Japanese bom bers and pursuit screen in the sky. Fiv of our 10 P-40s were already air-borne The other five immediately took off. On of our planes was shot down by three Zeroes as it crossed the border of th field. Another, just behind him, sho down a Zero before he had had time t retract his own wheels, was in turn shot down and parachuted to safety.

In that brief, destructive attack, whil the Japanese bombers were blasting al lied ships in the harbor, we lost eight of our ten P-40s. Only the armor in the planes and the fact that our flyers were fighting over their own territory cut the loss in the pilots to four.

How the favorable change in thi nearly impossible tactical situation has altered the performanee of our plane is best shown by recent events. On August 23, a force of 27 Japanese bom bers and 20 Zeroes attacked Darwin again. Our P-40s, now adequately fore warned, intercepted them. They shot down four bombers and eight enemy fighters and forced the rest to jettison their bombs. Not a single United States pilot was lost.

After the first shock of the surprise attack had been absorbed, United States effectiveness against the enemy immediately improved. For example, from recent battle history in the Solomons the Navy's F-4-F's knocked down 4 Japanese aircraft in four days without loss to our own force. A dramatic in crease in the destructiveness of Army aircraft has meanwhile, been continuing

Our Score Improves

Thus from February 1 through Sep tember 20, Army planes (including bombers) destroyed 279 enemy planes on the Asiatic and Australian fronts our losses were 114 planes (and a lesser number of fighter pilots). For the month of August a great improvement over this good average was shown— enemy planes destroyed, 75; United States planes lost, 15. In that month

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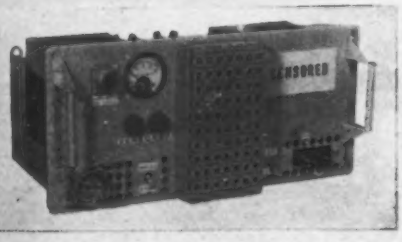
XUM

WE'RE KEEPING "Tough" COMPANY

. . . and we're PROUD of it!

Designed for Operating Portable Test Equipment in the Field

Input Voltage: 12 Volts
Output: 110 AC, 180 Cycles
Wattage Capacity: 30 Watts
Size: 4" x 4" x 6"
Weight: 3 lbs.
Efficiency: 75%



Tough Problem—But Electronic Licked It!

Input: 12 Volts DC or 110 Volts AC.
Output: 2000 Volts DC at 200 Ma.
450 Volts DC at 70 Ma.
+250 Volts at 30 Ma.
−250 Volts at 25 Ma.
10 Volts AC 7 Amperes
Approximate output wattage, 500 watts
Weight: 56 lbs. Size: 19" x 11" x 8"
Efficiency: 65%
Regulation: 13%
Designed for continuous operation at full load

IN RETURNING TO ACTION, after recent refitting, *H.M.S. Illustrious* relies on newly installed ELECTRONIC equipment . . . not only for herself but for the planes that fly from her decks. Tough company? Yes! *Magnificently so!* But only *one* of *many* rugged military assignments for Electronic: Tanks! Walkie-Talkies! Mobile Amplifiers! Jeeps! P-T Boats! *Not a "softie" in the lot!*

BECAUSE IT TAKES TOUGH PRODUCTS to keep tough company, Electronic is justly proud of her wartime role. And *tomorrow* Electronic Power Supplies will return to peacetime pursuits . . . at *your* service . . . *tougher* and *better* in every way because of their combat experience. Until then . . . CARRY ON!

Electronic LABORATORIES, INC.

INDIANAPOLIS

"This Aeroprop does everything but talk!"

"IT'S LIGHT—Not an ounce of useless weight about it. That means the Aeroprop delivers maximum horsepower and fight-power per pound."

"IT'S STRONG—And you can bet that strength pays off in safety and longer fighting service."

"IT'S SIMPLIFIED—Unit-construction puts automatic pitch control, plus the power for pitch changes, right in the compact propeller assembly itself."

Many a pilot on many a front could tell a better story of the Aeroprop than we can.

They've pulled the trigger on the deadly gun that pokes its barrel through the Aeroprop's hollow hub.

They're flying every day, and sometimes every night, so they praise the strength and durability of this steel propeller.

Too, they've been in spots where the pounds saved by the Aeroprop's simplified, unit-construction have meant the inches-to-spare or the instants-to-spare that count so much in high-speed fighting.

They know what it means to fly behind a propeller that is always "on speed," a propeller that responds almost instantly to every flight maneuver—climbing, cruising, diving, *fighting!*

They also know that quality goes into an Aeroprop. The best materials. The best American craftsmanship. Performance that is based on the latest achievements of propeller engineering, research and design. The day and night team-work of propeller engineers, production workers, and technicians of the United States Government, all working to produce more and more Aeroprops for America's mounting might in the air.

"Everything but talk!" The Aeroprop will never need to talk where ACTION speaks louder than words—where there are pilots who have flown with it, fought with it, and conquered with it.

AEROPROP

AEROPRODUCTS DIVISION **GENERAL MOTORS** CORPORATION

GM ARMS FOR VICTORY

Text of OWI Report on U.S. Planes

(Continued from page 10)

interesting to note that the score of the P-40s was 18 to 2; the P-39s score was 20 to 5. As this is written, the Army Air Forces are engaging the enemy around the world. It is consistently piling up a plus record.

A superficial deduction from this would be that there is not much use worrying about the quality of our fighter aircraft. Again, it would be an oversimplified conclusion. The fact is simply that under the tactical situations now existing in the South Pacific, in China and in other theaters, and with the improving methods of employment of our fighter craft, the score of United States pursuits has been on the winning side for months despite seemingly overwhelming numbers of the enemy. The average is improving. But this does not mean that we have won a decisive battle or gained permanent ascendancy in the air. A new and secret type of enemy airplane, a shift in enemy tactics which would force us into different battle conditions, could change the picture once again. All of us must keep such possibilities in mind. In this, as in all other wars, only complete victory is decisive.

In contrast to their unsuitability for high altitude service in Britain, P-39s and P-40s have shown on the record that they are valuable weapons in Russia and in Northern Africa. Again the explanation is in the tactical situation. Both are battlefield areas. The duties of aircraft in battle, where a great part of air force is used in support of ground troops, draw them down below the levels at which they would operate if working as independent airpower. A battle situation calls for a predominance of low-altitude work by dive bombers, bomber-strafers and army cooperation craft of all descriptions including low-flying pursuits. To situations of this kind the heavily armed and armored P-39 and P-40 are well suited. Their deficiency in altitude performance does not count heavily against them. Thus in the desert the P-40 long has been, and still is, a first-line pursuit weapon. With its latest improvements, it probably is the most efficient fighter in the desert. One of the apparent oddities of its employment in Africa is that it can compete on equal or superior terms with the German Messerschmitt, with which it could not adequately cope in the high altitudes of the European theater. Similarly its African performance has been as good as the justly famed Spitfire, and in certain tactical situations better.

In the similar situation on the Russian front, the cannon-carrying Bell P-39 has been employed effectively by our allies. The Russians report that it has turned in a crack battlefield performance, even besting the cream of the Luftwaffe's pursuit in the air. Details of its performance are lacking, but the assumption must be made that the encounters are at relatively low altitudes in which level German equipment is forced in order to do an adequate job of cooperation with ground troops or a satisfactory job of attack on Russian ground units and establishments. Similarly, in the Aleutians the strafing power and range of the P-39 have made it one of our most valuable weapons, particularly in attacks on ships, submarines and Japanese ground establishments.

A Few Notes on American Types

As indicated before, probably the most highly specialized combat type is the fighter airplane. As engineers now know design, no fighter can be the best in all things. Another determinant of the fighter's pivotal influence is the engine and its super-charging equipment.

North American P-51 Mustang
"One of the Fastest Fighters in the World"

The problem may be stated roughly as follows: a power plant which develops its maximum horsepower at low altitude will lose its effectiveness as it passes the critical altitude and the performance of the plane in all its flying functions—speed, climb, maneuverability—will progressively fall off. An engine which develops its maximum at high altitudes, i. e., above 25,000 feet, will have inferior performance at the low levels. This is because the full force of its supercharging equipment can not be used at the low levels—except for short periods of so-called "flash performance"—without overtaxing the engine and sending it toward complete mechanical failure.

Thus the possession of a crack high-altitude fighter does not mean mastery of the air. For complete domination, we need fighters capable of maximum performance at possibly three levels—sea level to 15,000, 15,000 to 25,000, and above 25,000. Probably we never will be unquestioned masters at all these levels (which are arbitrary figures only). Other variants in performance—*e.g.*, plane design, load and variation in power plant—will and do make for overlapping performances.

Specialized Pursuit Ships

The struggle in pursuit design is for supremacy at all levels, and until we can seize the offensive and force the enemy to fight at our most favorable altitudes we shall have to continue our engine and aircraft development relentlessly and skillfully. This we are doing. The Germans have been notable in recognizing the same fact and in acting upon it. The most recent example of this is the Focke-Wulf 190, a splendid pursuit plane powered with a specially designed air-cooled radial engine. For laymen who thought that the only struggle in the flying qualities of pursuit was for altitude, the Focke-Wulf 190 would be a technical disappointment. Close laboratory and flying studies of a captured model distinctly show that it is a middle altitude performer. Like some of our own fighters—notably the Navy's Grumman F-4-F it is equipped with a two-stage, two-speed supercharger. Thus it has enough flexibility to operate at great efficiency through an overlap of two of the levels named above.

Below 10,000 feet it has a spectacular rate of climb which falls off radically as it reaches the altitude limits of its low-speed supercharger. When the second-speed is engaged, it regains its sea level rate of climb and holds it handily until it reaches 18,000 feet. From that altitude on, it has passed the limits of flexibility that the two-speed blower gives it, and its performance falls off rapidly. Its design is specific recognition, by a technically proficient engineering and flying group, that pursuit is still bound down by the necessity of specialization, and that it will be so until radically new power and propulsion techniques have been developed.

Captured German Focke-Wulf 190
A 'Splendid' Pursuit at Medium Altitudes

The following descriptions of the most important United States warcraft now in service are not intended to be full or technical, but a summary for laymen of their records. In setting them down some repetition of observations already made is necessary. It will be noted that only passing reference will be made to types not yet in service. In this connection a few observations are in order, since many contemporary critics have a weakness for considering in their estimates the performance of aircraft not yet in service. A typical instance was the recent listing by a British writer of the 12 best aircraft types, as he saw them. Of seven American aircraft included in the list, two have not yet participated in battle.

Persumably this critic concluded that because both craft had been widely publicized more than a year ago, both must by now have had their battle test. The mistake could be charged as much to us as to him. In the unrestricted days of peace we were too ready to make the agile leap from the test of the prototype of a new aircraft to the day when it began rolling off the production line for service. Now we know. And now we are keeping secret the performances of our new aircraft lest we give information to the enemy. The current practice has another equally important effect: it stops wishful thinking which up to now has given the public a distorted idea of just how far, technologically, our battle aircraft have gone.

The best that can be said of the future is that the United States aircraft industry and the services are in an orderly ferment of developing specialized aircraft of high, and in some cases sensational, promise of battle performance. Some of them actually are flying, and for some production has begun. The temptation to all familiar with them is to make public the great hope they give for the near future. Some such promises are likely still to be made because it is human to look into the future. When they are made, the public should scan them with one thought in mind: until planes are battle tested, they cannot be called proven. And no sound appraisal of their effect in the war can be made until they have been proven. Where reference to development for future planes is made in the notes below, they should be scanned in the same light. Some have passed their tests in the laboratory and in the air, some are still to be tested with great promise of success. But full judgment must still be reserved until the ultimate test is made.

Fighters

Curtiss P-40. Single-engine, liquid-cooled. Most discussed of all United States combat aircraft, this fighter has gone through six major type changes (from P-40A to P-40F). Types now in wide use are the "E" (Kittyhawk) and "F" (Warhawk). Substantially improved through each change, it has the virtues of heavy hitting power, excellent armor, high diving speed, and leak-proof tanks common to all United States combat aircraft. Against the Zero it has proved on average to be superior. The Zero's advantages of fast climb, great maneuverability, and better ceiling are offset by its vulnerability and the fact that when a Zero goes down its pilot almost always goes down with it. He is riding a lightly built aircraft, highly inflammable—since it has no leakproofing and is without armor protection. It is

(Turn to page 16)

Wings over the WORLD
XUM

"The FULL development of Individual Personality"

...a 6 point post-war program by THE ARCHBISHOP OF CANTERBURY

What kind of a world are we fighting to create?

Pan American has presented answers to this question by America's great philosopher, Dr. John Dewey, and by Dr. Hu Shih, recently Chinese Ambassador to the United States.

Herewith we present a statement written for Americans and people throughout the world by the Most Reverend William Temple (Cantuar) the Archbishop of Canterbury.

THE STRUCTURE OF LIFE as we knew it before the war has already been profoundly modified. How far do we want to restore it if we can?

The task of the Church in face of social problems is to make good Christian men and women. That is by far its most important contribution.

But it is also part of the duty of a Christian to judge how far particular evils are symptoms of a disease deeper than the evils themselves.

There is nothing wrong about profits as such. It has always been recognized that both the producer and the trader are entitled to a profit which they have earned by their service to the community. But it is possible, nonetheless, for these two to get in the wrong order. Then the consumer is treated only as a *means* to success . . . *whereas* he ought to be considered the whole end of the process.

If that is true, it is the duty of Christians to become aware of it and to demand a remedy. I offer these suggestions as a goal to aim at immediately:

(1) Every child should find itself a member of a family housed with decency and dignity, so that it may grow up in a happy fellowship unspoiled by under-feeding—or overcrowding, by dirty and drab surroundings or by mechanical monotony of environment.

(2) Every child should have the opportunity of an education till years of maturity. This education should be inspired by faith in God and find its focus in worship.

(3) Every citizen should be secure in possession of such income as will enable him to maintain a home and bring up children in such conditions as are described in paragraph 1 above.

(4) Every citizen should have a voice in the conduct of the business or industry which is carried on by means of his labour, and the satisfaction of knowing that his labour is directed to the well-being of the community.

(5) After the war, every citizen should have sufficient daily leisure, with two days of rest in seven, and an annual holiday with pay, to enable him to enjoy a full personal life.

(6) Every citizen should have assured liberty in the forms of freedom of worship, of speech, of assembly, and of association for special purposes.

Utopian? Only in the sense that we cannot have it all tomorrow. But we can set ourselves steadily to advance towards that six-fold objective. It can all be summed up in a phrase: *the aim of a Christian social order is the fullest possible development of individual personality in the widest and deepest possible fellowship.*

* * *

I should give a false impression of my own convictions if I did not here add that there is no hope of establishing a more Christian social order except through the labour and sacrifice of those in whom the Spirit of Christ is active.

† † † William Cantuar:

ARCHBISHOP OF CANTERBURY

Never before in the world's history has the "brotherhood of man" been so close to reality as it is today.

For, the instant we win this war, all *geographical* barriers will disappear. The "foreigner" who used to be strange and different because he lived across an ocean, will become as familiar to you as the man in the next town. London and Paris will be ten hours from New York —Chungking, China, twenty hours from San Francisco.

And this travel will not be just for the well-to-do. Pan American's knowledge of technological improvements (based on more than 120,000,000 miles of overseas flight) indicates that air travel costs will be brought down within reach of the average man and woman.

Today, of course, Pan American's every transport facility is working overtime to help make possible the Victory on which all our plans for a better world must be built.

PAN AMERICAN WORLD AIRWAYS SYSTEM

PAN AMERICAN CLIPPERS

XUM

Text of OWI Report on U.S. Planes

(Continued from page 13)

Martin B-26

"No Nation . . . Has So Efficient a Plane in Its Class"

not this poorly protected Zero fighter that American pilots prefer. But most P-40 pilots frankly say that they would like more altitude, if they could still maintain their advantages of superior firepower and protection.

Bell P-39 (Airacobra). Single-engine, liquid-cooled. A part sharer in the criticism heaped on the P-40, the P-39 has roughly the same limitations and the same positive virtues. Developments now being made in this design give the promise of much improved performance while retaining all its virtues, including splendid visibility for the pilot in missions cooperating with ground troops. Armed with a cannon as well as machine guns, it is also a powerful ground-strafing craft.

North-American P-51 (Mustang). Single-engine, liquid-cooled. Newest of the Allison-powered United States pursuits, the P-51 has been quietly developed. It did not come prominently into public notice until the British had used it in the raid on Dieppe. One of the fastest fighters in the world, it has roughly the same limitations on altitude performance of other single-engined Allison craft. Improvement in the power plant (treated above) and other technical changes promise a sensational improvement in the altitude performance of this airplane.

Lockheed P-38 (Lightning). A two-engine, liquid-cooled pursuit plane, the P-38 has so far had only limited tests in action, notably in the Aleutians. Its performance has been brilliant. Turbo-supercharged, it has excellent high altitude performance. Its long range (exceeding the range of the Spitfire, Messerschmitt 109 and Focke-Wulf 190) and its great firepower, give it real promise as an escort to our high-altitude bombers. At its best altitude it is one of the world's fastest fighting aircraft. Nevertheless, constant improvements are being made.

Republic P-47 (Thunderbolt). Powered by one of the largest United States air-cooled engines, the P-47 has been thoroughly tested, is in service and in production. It is turbo-supercharged, heavily armed, and has a greater high speed than the P-38 at extreme altitudes. Its trial by battle is not far off.

Grumman F-4-F (Wildcat). The Navy's standard fighter, as of today, the F-4-F is unquestionably the best carrier fighter now in battle service. Powered with an air-cooled engine, with two-speed supercharger, it has shown altitude performance that comes close to the Zero. Its lower rate of climb and maneuverability are offset by its characteristically heavy armor and armament. Designed primarily for carrier work, it has folding wings for compact stowage. Like most such specialized installations, this feature steps up the weight of the F-4-F by 5 per cent and thus cuts down slightly on its performance. The sacrifice is heavily overbalanced by the fact that it increases a given carrier's complement of fighters by 50 per cent.

In the Solomons, F-4-Fs operating against Japanese fighters and bombers have been destructive and in many encounters decisive. Yet superior replacements for the F-4-F are already in production.

Heavy Bombers

Boeing B-17 (Flying Fortress). A tried and thoroughly tested model with an unequaled combat record (four engines, air-cooled turbo-supercharged), the B-17 is essentially a high-altitude, long-range bomber designed for precision destruction of restricted targets at great ranges. Often compared, sometimes unfavorably, with the British Lancaster, it is not in the same category. While it is primarily designed for day bombing, it is easily convertible in the field for night bombing at lower altitudes and shorter ranges, with greater loads. This dual function is not possible with the specially designed, slower night bombers. The Lancaster is designed for night bombing, hence has much less altitude and speed performance, but is capable of carrying a heavier bomb load on short and middle distance missions. In its armament equipment, the B-17 has been most inaccurately characterized as deficient. The fact is that it is one of the most heavily armed bombers in the world. It has indicated by its work in the Pacific and over Europe as well, that it can carry out high altitude day-bombing missions under the protection of its own guns and without fighter escort. Gunners in Flying Fortresses have shown that its destructive, high-rate .50 caliber machine guns have greatly extended the effective range of the bomber's defensive fire.

Consolidated B-24 (Liberator). Another four-motored, air-cooled bomber, turbo-supercharged like the B-17 and capable of operation at high altitudes and over great ranges for high-accuracy bombing missions. In the Pacific, in Northern Africa, Europe, and the Aleutians the B-24 has shown itself a top-flight performer, capable of duplication of the B-17s record.

Medium and Light Bombers

North American B-25 (Mitchell). A battle tested (two-engine, air-cooled aircraft of speed, long range and good load carrying characteristics, chiefly dramatized for the United States' public by the raid on Tokyo. No airplane of the same class in friendly or enemy air forces is known to equal it.

Martin B-26 (Martian). Two-engines, air-cooled. This is also a battle tested plane in general comparable with the characteristics and performance of the B-25. No nation but the United States, so far as is known, has so efficient a plane in its class.

Douglas A-20 (Boston or Havoc). A light (two-engine, air-cooled) bomber widely used by the British in the European and Egyptian theaters. Flexible in its performance, it has also been employed with modifications as a heavy fighter. It is unquestionably one of the best in its class.

Douglas SBD (Dauntless). (Army counterpart A-24). The Navy's carrier-based standard dive bomber (single-engine, air cooled), this craft is the best in the world in its category. As a land-based craft it may find its equal or even its superior in the Germans' latest Dornier and Junkers multi-motored craft. It will shortly be supplemented by a newer design now in production.

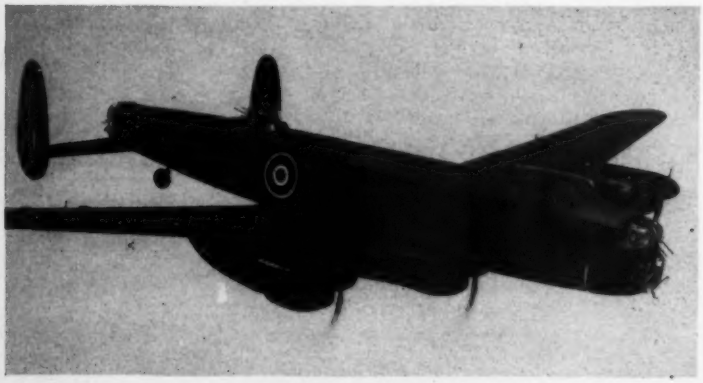
Douglas TBD (Devastator). The Navy's standard torpedo bomber when we entered the war, this single-engine, air cooled aircraft was as good as the best in service in any Navy. Yet development already under way soon caught up with it and it is being replaced by the:

Grumman TBF (Avenger) Single-engine, air cooled. This plane made its battle debut at Midway. A bigger, more powerful and in all respects more advanced airplane, the TBF is the best carrier-based torpedo plane so far seen in action in the war.

Patrol, Reconnaissance and Miscellaneous

In this field, United States development has been satisfactory in quality. The Navy's patrol bombers are the equal of any in the world, and in range (the basic necessity of the work of such craft) they are probably superior. One of the Navy's types, the famous PBY has been criticized for lack of speed. Such craft are not built for speed but for ability to stay long hours in the air and to land on rough water for refueling and servicing. In these capabilities the PBY is a superior aircraft. Its employment, however, is now overshadowed by later types, notably the new Consolidated and Martin patrol boats.

In the Army Air Forces the requirements of a plane for every task have brought into the military field many aircraft not mentioned in the foregoing summary. They range from troop carriers and transports down to the "grasshopper" planes for liaison, fine artillery fire adjustment, etc. These types are very good, on the average, and many of the newer craft are definitely superior to comparable equipment in other air forces. Rising production in this general category should give the United States Air Forces the best equipment of this kind in the world.



British Lancaster

Carries More Bombs But Is Slower Than B-17

Can the Pace Be Maintained?

Earlier in this report it was stated that on average the combat performance of United States' aircraft was good. In the past two months it has been more than that: in many theaters, notably the Solomons and Australia, it may have been too good. That is to say, due to unusual tactical situations and other considerations, the pace may well have been too fast to be kept up. In this war, the United States has just begun to fight. In the months to come battles may be lost and crushing defeats may be suffered. It seems certain that as our offensive activity is stepped up, casualties will increase and the losses in aircraft will rise with the spread of our participation.

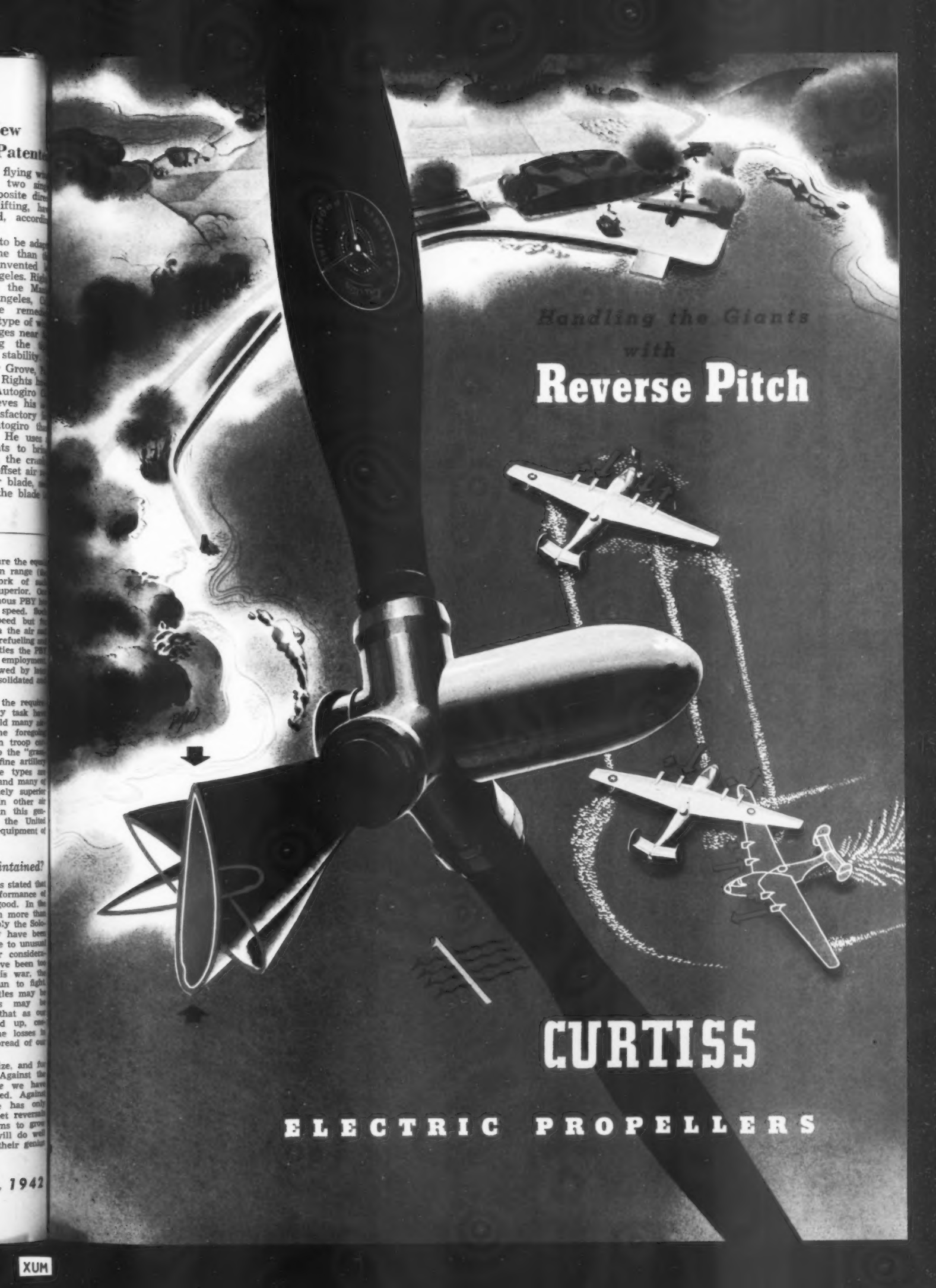
This the public must realize, and for this it must be prepared. Against the proficient German *Luftwaffe* we have yet been only slightly engaged. Against the Japanese our offensive has only barely begun. When we meet reversals and the pull to victory seems to grow long and hard, Americans will do well if they indulge to the full their genius for critical self-analysis.

Flying Wing, New Propeller Patent

A new version of the flying w and a propeller with two sm blades revolving in opposite dire tions, for horizontal lifting, ha been recently patented, accordi to press reports.

The flying wing, said to be adap able to a smaller plane than t Northrop type, was invented David R. Davis, Los Angeles. Rig have been assigned to the Ma Aircraft Corp., Los Angeles, C Davis claims to have remed previous defects of this type of w by curving the front edges near tips, and by rounding the which provides greater stability.

Gage W. Tidd, Willow Grove, invented the propeller. Rights ha been assigned to the Autogiro of America. Tidd believes his a rangement is more satisfactory a helicopter or an autogiro tha two-bladed propellers. He uses system of counterweights to bri about proper balance in the cra shaft. Counterweights offset air sistance to the propeller blade, fine adjustment causes the blade run smoothly.


Handling the Giants
with
Reverse Pitch
CURTISS
ELECTRIC PROPELLERS

● Bombs to blast the Axis—that's the pay-load of the Brewster *Buccaneer* and *Bermuda*. Packed with destruction for dictators, these newest American dive-bombers are built to hit the enemy, hit him hard, and then to hit him again.

BREWSTER *Blasters*

BUCCANEER AND BERMUDA DIVE BOMBERS

Marshall Hits At Critics Of U.S. Aircraft

(Continued from page 7)

verable. However, as a fighting machine it lacks in certain important characteristics, high speed, fire power, leakproof tanks and armor protection for the pilot and vital parts of the aircraft. Its record in combat with our fighters and bombers has demonstrated its tactical inferiority.

"The importance of the distinction between flying machines and fighting machines is indicated by a statement in a report I have just received from an experienced Army pilot, whom I sent on a special mission to New Guinea and the Solomons to observe air activities. He said, 'I have talked to many, but cannot find a single fighter pilot who would voluntarily fly a Zero in combat against our P-40 or P-39, or who would prefer our fighters stripped.' Also, Gen. Kenney, commander in chief of Allied air forces in the Southwest Pacific, recently stated that, 'In all my travels I haven't yet met an American or Australian pilot who would trade his Kittyhawk fighter (P-40) for a Zero.'

"Since the American P-40 fighter plane does not possess the maneuverability or the fast rate of climb of the Zero, it has been the object of considerable criticism. However, judged on the basis of demonstrated combat efficiency, the P-40 is greatly superior to the Zero in fire power, ruggedness and invulnerability to enemy fire. It has self-sealing tanks, armor plate, rugged construction and heavy fire power. These fighting features add weight to a fighter aircraft, decreasing its rate of climb, limiting its ceiling and reducing its maneuverability. Such factors were considered when the plane was designed for its specific combat mission. That it is fulfilling its mission is indicated by the record of one of our fighter groups in the Southwest Pacific, which shows that it has destroyed 49 enemy Zero fighters with a loss of only five of our fighter pilots.

"United States combat experience with the P-38 and the P-47 is too limited to form conclusive judgment as to their combat value. There has, however, been nothing to indicate that they will be any less effective in their respective fields than the P-40 and P-39.

Praises Designers

"With respect to our bombers, the B-17 and B-24 are today demonstrating the foresight and aeronautical skill of American aircraft designers. In daylight operations over Europe and in the Southwest Pacific, the B-17 has apparently demonstrated that it is the most powerful and effective bombardment airplane at this time. Its ability to destroy enemy installations and its great defensive power in repeated combats with the Japanese Zeros and the latest German Focke-Wulf fighters have proved its superiority in high-altitude daylight precision bombing.

"Battle reports from each of the nine areas in which American aircraft are engaged contain ample testimony that the U. S. Army Air Forces have fine fighting machines. In fact, the present box score is too good. It may lead to false hopes for the future, since it is entirely possible that these very favorable combat results may not be uninterruptedly maintained.

"The recent criticisms directed against our aircraft inevitably have a disturbing effect on the morale and fighting spirit of the young pilots which will reduce their efficiency and endanger their very lives. That the criticism has usually been irresponsible and without regard to the battle reports of losses and has ignored the development of planes for particular theaters or types of operations does not offset the serious harm done to the fighting morale of our forces and has added considerably to the task of the Army in meeting the hazards of critical situations in almost every corner of the globe."

Chamber's Future Vague

(Continued from page 1)

from the Chamber and perhaps set up their own organization.

Far from being an East vs. West Coast dispute of the type which has often threatened industry unity, the present trouble appears to be in the fundamental organization of the Chamber with most of the large companies agreeing that the continued existence of the present Chamber is unworkable and costing too much for value received. The present dissenters are all large airframe companies who feel the Chamber no longer speaks for them but is engaged in too much general work of broad scope for smaller companies whose interests may or may not harmonize with those of airframe companies.

Among proposals discussed is one to form several trade associations, one for airframe manufacturers, another for parts manufacturers, and another for other groups now included in Chamber membership, either as separate organizations or as autonomous units under one general organization. But there is considerable feeling against the present name of the Chamber and if the trade association idea is carried out the name of the organization will doubtless be changed.

It seemed clear as this issue went to press that dissension was so strong, and so many large companies were united in their stand against the present Chamber, that only a very radical reorganization could keep all of the industry together in one organization.

The resignations apparently came spontaneously inasmuch as a few weeks prior to the first action the various west coast companies had given nominal assurances that they would not resign. Many of the secondary eastern companies were entirely uninformed about the causes of the dissension, and at the executive committee meeting there was little or no discussion about reasons for the resignations.

More than one executive commented that the Chamber's budget was too large for what it actually accomplished, but on the Chamber's part the answer was that the staff merely endeavored to do what it was told by the membership to do, and that for every member company there was a different idea of what the Chamber should or should not be doing.

One basic issue that has inspired fireworks for several years is the Chamber's publicity committee and the membership still seems widely split on what they think the Chamber should and should not do in this direction.

Another criticism voiced was that the Chamber had not taken sufficiently strong action on such matters as critical material, Selective Service, manpower, etc.

At the time of the famous annual meeting of the Chamber in January, 1939, many important companies were not members. When Col. John H. Jouett replaced Leighton Rogers as president at that time, the non-members began joining up and finally Glenn L. Martin Co., which had never been a member, joined to make the Chamber 100% representative of the entire industry. All during 1941 and 1942 the Chamber represented a united front. Early this year, however, the eight airframe manufacturers of Southern California formed the Aircraft War Production Council to deal with their own mutual problems. Recently an east coast Council was formed.

To what extent these two councils may replace the Chamber was impossible to indicate as this issue went to press.

Fast Trainer: Britain's Miles Master III is "the fastest single-engined trainer aircraft in the world," according to Phillips & Powis Aircraft Ltd., manufacturer of the ship. No performance data have been released. The plane is powered with a Pratt & Whitney SB4-G 14-cylinder engine rated at 750 hp. at 9,000 ft., with 825 hp. available for take-off, according to "Jane's All the World's Aircraft."

Advertisement

IN THE DAILY

This Is Leadership!

Did you know the British Air Commission issues a daily mimeographed news bulletin for the hundreds of British aviation personnel in Washington? We didn't either, until the other day. It is under the direction of Sir Vivien Gabriel, and covers the preceding day's *significant* aviation news from the leading U. S. and British news journals. The copy which was given to us was eight letter-size pages and shows considerable skill in outlining and condensation.

What struck us was the dependence of the staff on *American Aviation Daily*. There were quotations from the preceding day's *Daily* under each of the Commission's nine classifications: production, facilities, materials, labor, personnel, firms, operations, ferry, and information.

In fact, there were so many items taken from the *Daily* that we counted them up, along with those of all other publications. Here's what we were amazed to find:

American Aviation Daily	23
New York *Times*	5
Washington *Times Herald*	4
Associated Press	2
New York *Mirror*	1
United Press	1
Washington *Post*	1
Wall St. *Journal*	1
New York *Herald Tribune*	1
London *Times*	1

Where could you find a better index to the publication you must depend on for ALL of the important and official aviation news of the day?

• • •

Here are two more statements from *Daily* readers that speak for themselves:

From Oscar Bergstrom, Assistant General Traffic Manager of Delta Air Lines: "Mr. Woolman uses the *Daily* as his bible and reads it thoroughly." (Woolman is Delta's vice-president and general manager, of course.)

From N. S. Hare of Southern Aviation Insurance Co., Birmingham: "We have found *American Aviation Daily* to be the only authoritative medium for securing aviation news as it develops. To any of us in the aviation business your reporting is more than just interesting: it is vital."

Both of these "testimonials" are unsolicited.

Our constantly increasing subscription list bears convincing proof of the day-to-day necessity of the *Daily* to top executives in manufacturing and air transport, with a noticeable upturn in interest by educational circles and government officials.

In addition to all official news and regulations, two popular new features, *Trends & Forecasts*, and *Background of the News*, are arousing favorable comment.

If you haven't yet seen samples of the only daily in the aviation or automotive fields, write today: American Aviation Daily, American Building, Washington, D. C. A week's subscription free to executives.—R. H. W.

XUM

NWLB Briefs

As its first action under the new Wage-Price Control Executive Order, NWLB placed its approval upon all wage increases that had been put into effect on or before Oct. 3, but reserved the right to order discontinuance of further payment of such increases which later might be found to be inconsistent with the Executive Order, or with any policy furnished by the Economic Stabilization Director.

Pending further developments, all existing NWLB procedures for settling labor disputes will continue, Chairman Davis stated, as he reaffirmed the Board's intention to follow the "Little Steel" formula in adjusting wages in cases brought before it. In the meantime, faced with the probability of a greatly augmented program of wage jurisdiction, including salaries, NWLB announced that it had unanimously adopted a General Order under which wage adjustments by employers of no more than eight individuals would be exempt from the provisions of the Executive Order.

Blanket wage adjustments need not have the specific approval of NWLB, it was stated in another release, if they fall within the following prescribed limitations: (A) Individual promotions or reclassifications; (B) Individual merit increases within established rate ranges; (C) Operation of an established plan of wage increases based upon length of service; (D) Increased productivity under piece work or incentive plans; (E) Operation of an apprentice or trainee system. However, it was emphasized that such adjustments should not result in an increase of the level of costs or increase price ceilings.

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In its decision on the Chrysler Case, in which the Board granted workers an increase of 4c an hour "in order to bring their increases since January 1, 1941 up to the 15% increase in cost-of-living between then and May 1942, the term "inequalities" has been defined for the first time.

Dr. George W. Taylor, vice-chairman, stated: "It should be pointed out that differences in rates are not necessarily inequalities in rates. On the contrary, the wages paid in American industry are normally characterized by all sorts of differentials created for many different reasons. Under any sound program for stabilizing wages in this time of war it must be presumed that well established differences in wages are not inequalities. This approach was accepted by the Board in considering the question of North-South differentials in the textile cases. Such an approach is particularly to be followed when such differences in wages have been established by collective bargaining procedure. One must not interpret the above-stated presumption, however, as an indication that established differences in wages can never become inequalities. They may be subject to adjustment if they have become inequalities which must be rectified in the interests of full production of war goods. The point is, however, that a showing of inequality in wages requires much more than a showing of differences."

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In allowing a 10c-an-hour increase to Detroit tool and die makers in the plants of Ford, Chrysler & General Motors, while placing a ceiling of $1.75 an hour over wage rates in independent job shops, NWLB stated that maximum rates had to be set up in the jobbing shops in order to stop the "upward spiraling of rates which had caused an unstable rate condition. A failure to narrow these inequalities would, in the opinion of the majority of the Board, perpetuate an inequitable relationship. Common sense dictated the need for avoiding a lowered morale and an ultimately larger labor turnover . . . such results could not be lightly contemplated in an industry as vital as tool and die manufacture."

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Ford workers were denied their demands for $1-a-day wage increase in a unanimous decision of the Board. In the opinion written by Dean Wayne L. Morse, it was indicated that any wage increase at this time would not be in the interest of wage stabilization, "but would violate the principles and purposes of the Executive Order, which seeks to stabilize the economy of the country in the interests of the war effort."

It was pointed out that Ford employes, since January 1, 1941, had received a 25% to 28% increase in their straight hourly rate. Granting a wage increase on top of this "would amount, in fact, to creating a gross inequity, when viewed from the standpoint of the wages paid in the industry as a whole."

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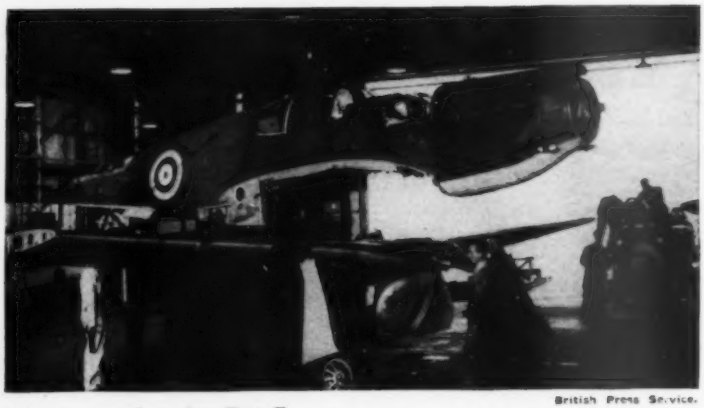
Wildcat strikes which have plagued the industry have been denounced by NWLB, which has now agreed to try to prevent them.

A three-point program adopted by the Board specifies that:

1. All Board mediation panels and investigators assigned to cases where there have been strikes or lockouts are to report to the Board the relation of local and international union officers to the strikes and of their efforts to prevent its occurrence.
2. These panels and investigators are to report also on the relation of management to the strike, particularly on the question of whether management has fully discharged its obligation to settle all grievances as promptly as possible.
3. On the basis of a thorough investigation, these panels and investigators are to make recommendations for the prevention or repetition of such strikes.



British Press Service.

Mustangs for the RAF: Photo shows a North American P-51 Mustang being assembled in England for delivery to the RAF. Mustangs were used successfully in the Dieppe raid.

Embry-Riddle Names Blakeley and Fator

Embry-Riddle School of Aviation, Miami, Fla., has named James E. Blakeley director of the school's technical division and Lieut. Charles D. Fator general manager of the landplane base at Chapman Field.

Blakeley, who formerly was supervisor of the school's military training, succeeds A. W. Throgmorton, resigned. He is a charter member of the Aeronautical Instructor Society and holds five ground instructor ratings.

Fator Blakeley

Lieut. Fator started flying at Brooks and Kelly Fields in 1921 and served with the Air Corps at Mitchell, Kelly and March Fields. In 1932 and 1933 he was in Honolulu with the 18th Pursuit Group and returned to Chrissey Field in San Francisco when the Army took over the air mail.

Speeds Drying: Two AAF maintenance mechanics place a paint dryer in position over a newly-painted wing catwalk at Enid, Okla., Army flying school. Paint jobs must be dried by heat in order to keep training planes "on the line" a maximum amount of time.

WMC Summary

APPRENTICESHIP PROGRAMS: Listing forty-six approved apprenticeship programs in aircraft and airline industries, Chairman Paul V. McNutt reports that the number of apprenticeship programs in war production have doubled during the past twelve months. Of 1,5[illegible] approved programs now in effect, 1,4[illegible] are planned to meet the specific training requirements of individual establishments. The remaining 888 are trade programs, covering the training of apprentices in a recognized craft within a city or other geographical area.

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"SPECIAL HANDLING" IN 11 AREAS: Announcing a new "voluntary" manpower program for eleven areas in which "labor and housing problems have become serious," the War Manpower Commission indicates that this might be the start of a nation-wide manpower control plan. The program is to be based upon the try-out campaign conducted for the past several months in the Baltimore area. According to Mr. McNutt, the plan should result in speeding up the orderly transfer of workers from non-essential to essential industries and will check pirating of skilled workers. The eleven areas chosen are: the States of Washington and Oregon, and the cities of Buffalo, Akron, Louisville, Mobile, Oklahoma City, Portland, San Francisco, Los Angeles, Phoenix and St. Louis.

The area director will be under the general supervision of War Manpower's regional director and will set a committee patterned after the labor-management committees established by the War Production Board in industries. On the area director's staff are to be representatives of the United States Employment Service, the Labor Production Division of WPB, the Civil Service Commission, the Work Projects Administration and the manpower branch of the Services of Supply, U. S. Army.

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WOMEN WORKERS: Intensified recruitment and training of women workers on a voluntary basis in all phases of war production is scheduled for immediate action. A definite policy laying down basic national standards for the induction of women in the labor market has been approved, and Chairman McNutt advises that plans for implementing the policy are now under way. The regional manpower directors and the newly appointed area directors are being instructed to give the program precedence over other matters, a WMC official states. Special local womanpower campaigns, such as those recently conducted in Baltimore and Detroit, will probably be used to publicize the program and obtain data upon available numbers and classifications of potential women workers.

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NEW MANPOWER SCHEME: An executive order from the President is about to be sought by War Manpower officials requiring all employers in civilian as well as in war production activities, to hire all workers through the United States Employment Service. Such a control over hiring workers, which would be exerted through a system of labor priorities, is suggested as a means of solving many of the present-day problems of manpower without recourse to a labor draft law.

McLaughlin With Jordanoff

George McLaughlin, for many years editor of *Aero Digest*, has become executive director of production for the Jordanoff Aviation Co., New York, publisher of books on aviation. He was succeeded at *Aero Digest* by Michael Froelich, former managing editor.

TODAY . . . IT'S MEN AND SUPPLIES
TOMORROW . . . EVERYTHING!

Today, Air Forces of the United Nations are drop-shipping men and supplies in parachutes equipped with Joyce-made fittings. More than a dozen leading manufacturers are using Airchox-Joyce Parachute Hardware for greater safety and reliability. This is a tribute to the skill and precision employed in the making of every piece of equipment bearing the Joyce name.

Tomorrow, from the same skies—brightened with Peace—will float farm-fresh dairy products, fruits and vegetables . . . mail and express . . . from giant cargo ships in too much of a hurry to land for the conventional type of unloading. And these parachutes, too, will be equipped with special Joyce-made fittings to insure safe landings F.O.B. the Sky.

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people with a PUNCH

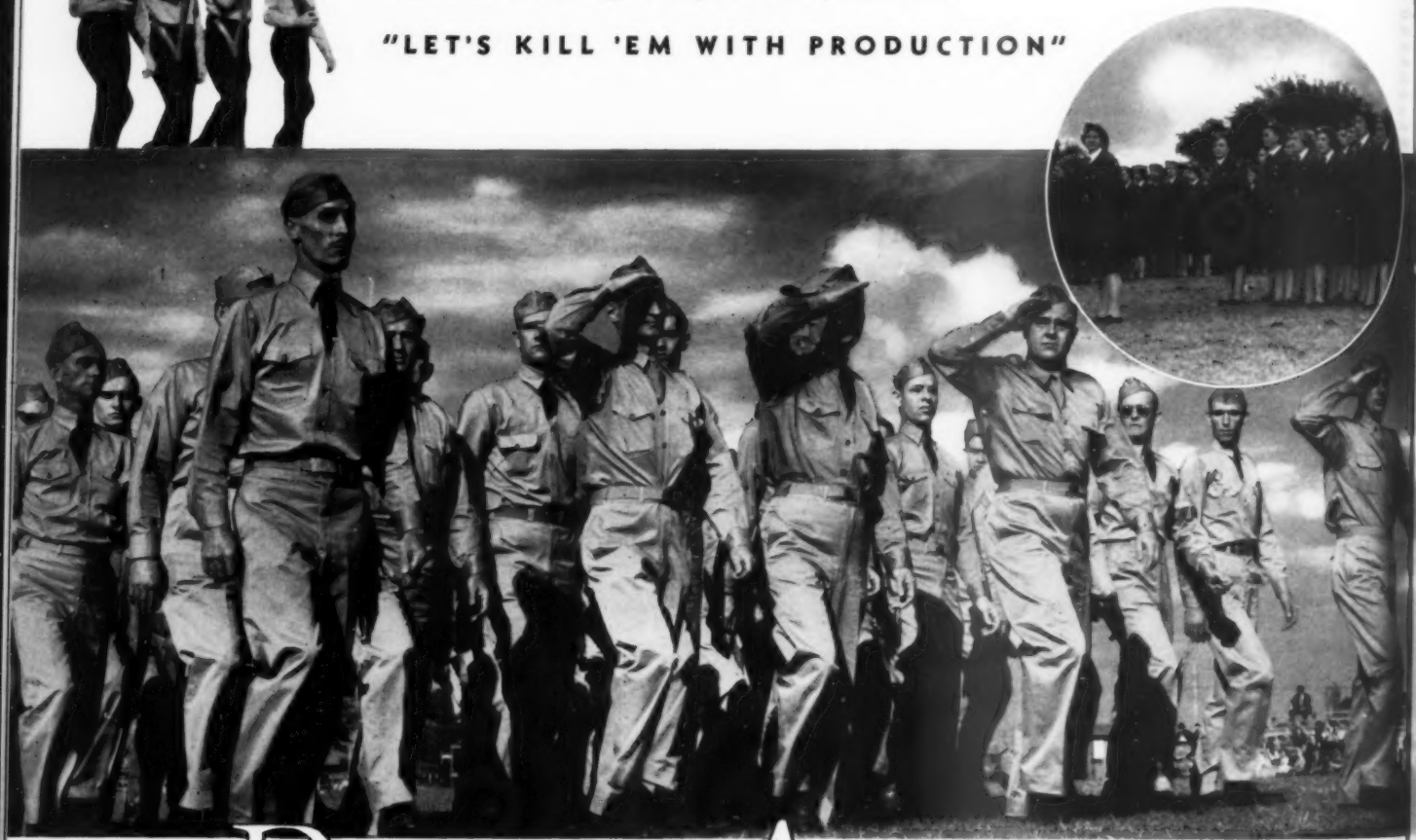
The spirit of personal sacrifice and extra contribution to the war effort is typical of Beechcraft employees, and is especially strong among the hundreds of men and women of the Beechcraft Reserve Guard, some of whom are shown in review below.

These employees voluntarily drill and practice in their free time so that they may be ready to meet any catastrophe or emergency that may arise, whether caused by enemy bombing, fire, sabotage, or act of God. They have sworn to protect life, war material, and the plant, in the interest of the war effort. They come from all departments of the Beechcraft organization, serve without pay, and buy their own uniforms.

Other Beechcrafters are members of the highly efficient Volunteer Fire Department, and still others are members of the Employees Club and of the Whiskers Club. These latter pledged themselves not to shave until certain high increases in production had been attained. Their beards are long gone but now they and the members of the Employees Club freely donate their own time to creating benefits for service organizations.

Production figures are the best proof of the devotion of ALL Beechcrafters to winning the war, but cannot be divulged. The next best proof is that Beechcrafters are voluntarily investing, not 10%, but OVER 20% of their total gross payroll in War Bonds! And the next best proof that they are putting their hearts as well as their heads into their war contribution is their grim slogan of deadly earnestness,

"LET'S KILL 'EM WITH PRODUCTION"



Beech Aircraft

CORPORATION

BEECH AIRPORT WICHITA, KANSAS, U.S.A.

Must Smash Luftwaffe—Rickenbacker

(Continued from page 6)

will remain an air theater until we have secured superiority over the German Air Force and paralyzed the production capacity of the German aircraft industry.

We have heard a lot of talk in America, and a great deal of misinterpretation of day bombing and night bombing. Strictly speaking, it is not a matter of day bombing or night bombing, but day-and-night bombing, with day bombing mainly being devoted to specific objectives, and night bombing aimed mainly on larger areas such as enemy industrial centers. Both types of bombing are important and necessary.

While heavy English bombers can operate in the daytime, they are night bombers mainly. American heavy bombers, on the other hand, can operate in the night-time as well as in daylight. They have proven, repeatedly, in actual combat that their speeds, altitude and terrific defensive fire power make them dangerous game for enemy fighters.

Theory Sustained

Since American bombers can operate in both daylight and dark, with equal disregard for enemy fighters, and since they can engage in both precision and area bombing, it seems to me that there can be no question whatever that the AAF bombardment theory is well sustained in the crucible of practice.

As for Fighter planes, the fog of confusion that existed regarding the respective qualities of American and British Fighters, is rapidly being dissipated. The fact that American fighter pilots in England flew the British Spitfire was widely misinterpreted in this country as meaning that our own fighter planes were inferior to the Spitfire. That is not at all the case. To begin with, our pilots flew Spitfires in England because Spitfires were available, thus saving the trouble of sending American made fighter planes to England. Secondly, by using Spitfires in England, we were able to send our fighter planes to other fronts.

Without any quibbling whatever I can say that the British have strong admiration for both our Fighter and Bomber types and that they look to the time when the newest types of these planes will be available to English pilots. By this, I do not mean to say that our planes are perfect. No plane ever attains ultimate perfection. Warfare, among other things, is a constant battle for superiority in which both sides have only momentary advantages so long as they remain alert and ready to make changes. I have full confidence that the tactical and technical officers in our Air Forces, as well as manufacturers and aircraft designers, realize that quality is a quantity in itself, and that quality is the fruit of constant improvement, through constant experimentation.

Visits Important

To this end, I strongly recommend that the production head and the engineering head of all American Army combat type plane manufacturers visit the proper English and American commands in England at least twice a year. This is because changes are so rapid in combat types on both sides that information received in cold print takes too long and loses its importance when it has to be sent from 3000 to 6000 miles for interpretation. With such liaison, valuable time would be gained and improvements in development would be materially speeded up.

The U. S. Air Forces in England are in exceptionally good shape with respect to high command leadership, even down to the group, squadron and flight leaders. U. S. Army aviation has a great asset in the fact that virtually all of the senior officers in the various commands and their staffs had extensive experience in World War I and have kept abreast with the times. The effort that is being made here at home toward the careful selection of flight, squadron and group leaders is paying dividends in England. It is proper that leaders should be developed to the highest point of efficiency before arriving on any front. Never before has leadership played such an important part in aerial warfare.

Morale High

In the course of my stay in England, I visited virtually every Fighter and Bomber station of the AAF. I talked with the members of the air crew and ground crew and found throughout the entire structure the high type of morale that can exist only where men are satisfied with their work, contented with their treatment and have pride in their equipment. Their general health condition is excellent, the food beyond criticism and the men are well provided for with respect to clothing.

The understanding between the English and American personnel is exceptionally good from the top down. The English have gone out of their way to welcome the American air contingents and render them every assistance. This applies to the military as well as to the civilian population.

The picture I obtained with respect to the progress of the war on the Western Front is that the trend is entirely in our favor. As far as I could ascertain, the total German Air Force does not exceed 4700 operational combat planes of every type, a very small percentage of these being bombers. It would be a mistake, however, to draw the conclusion that German air power is on the decrease. While we may hope that British and American bombers have crippled German aircraft production and maintenance in Germany and France, the case may well be that the Germans are working feverishly on new design planes to offset the aerial superiority which, at the present writing, is definitely on the Allies' side.

Will Suffer Losses

We are bound to suffer losses, maybe even great losses, before the conquest of Germany is completed. There is no question that we will win this war. The only question is how soon. That question can only be answered by figures of production because the first line of offense is the production line.

In that connection, I may point out that our problems with respect to airplane types are behind us. Our bombers have proven their worth with respect to types and tactics. All that remains now is to continue our experiments to improve types now in service and the new heavy high altitude bombers that already have left the blueprint stage. The same holds true with respect to fighter planes now in service in England. These include the P-38, the P-51 and the P-39. As for light and medium bombers, the A-20, B-25 and B-26 have also won deserved praise for their highly efficient basic characteristics.

I may add here that the new Spitfire-9 is a great improvement over the previous type of this fighter which saved the day in the battle of Britain.

While I do not feel at liberty to discuss the progress and production of British planes, I can say that the British are continuing along their established line of long range night bombers. I see in this a very happy union of British night aerial bombing and American daytime precision bombing which will complement each other into round-the-clock bombardment, in increasing tempo and extending range as more equipment and personnel becomes available. In fact, day bombers will be able to serve as pathfinders for night bombers by lighting fires on enemy targets in the daytime—fires which will serve as beacons for the bombers in the night.

As I said before, the picture, from our standpoint, is as bright as the grim portrait of war can be. But let us not be complacent about it. The cancer of complacency is deadly. We must keep our aircraft plants going at full capacity and send a steady stream of bombers, fighters, air crews and ground crews, and all that goes with it, flowing on to England, so that in time there will be a constant cloud of Allied combat craft over the skies of Germany.

'Tremendous Stimulant'

In connection with production, the warmest ray of hope that has come to England for a long time has been the fine performance of American planes and pilots across the channel, plus the cheering news of increasing production ratios in the United States. The report of President Roosevelt's industrial inspection tour proved a tremendous stimulant, coupled with the favorable articles on labor and production sent to English newspapers by their correspondents in America.

In England, I found a country that has mobilized all its resources for victory. All the man-power, all the woman-power is employed in the war effort. I noticed with satisfaction on my return that we here at home have finally swung around to the idea that we must have in the Army boys of the age of 18 and over. This is an important forward step because we cannot be too prepared for victory. By conditioning our youth for military service, we are increasing our striking power when the time for striking comes by the ground forces. Meanwhile, what we need now is more and more of what we have in the form of aircraft, flight crews and ground crews for the battle in the air.

71 Years Old: F. E. "Pop" Lickey, 71-year-old woodworker, is now helping build cargo gliders at Boeing Airplane Company's Kansas plant. Working with him are his three sons, his grandson and a son-in-law. "It's just play for me here . . . I used to work with big heavy pieces of wood and build whole houses," Lickey said.

Army-Navy Bulletins

Wright Field Changes: War Dept. reports these changes at Wright Field: Col. James Taylor becomes Air Inspector of the Materiel Center and the four AAF procurement districts; Col. William D. Eckert succeeds Taylor as Chief of the Office of Statistical Control, Materiel Center; Col. Edward H. White will take a new position in the Air Service Command, effective when it is transferred to Patterson Field Headquarters, and Col. Edwin H. Rawlings succeeds Col. Philip Schneeberger as Chief of the Industrial Planning Section.

Safety Record: Carlstom Field, Arcadia, Fla., operated by the Embry-Riddle Co., claims it has not had a "single fatality or injury to any of the thousands of Army cadets trained since flying operations started 18 months ago."

Plants Honored: War and Navy Depts. have announced the following plants as recently receiving the Army-Navy Production award: Beech Aircraft Corp.; Bendix Aviation Corp., both the Eclipse-Pioneer and Philadelphia divisions; Edo Aircraft Corp.; General Motors Corp., Allison division; B. F. Goodrich Co., Akron plant; Lights, Inc., and Marquette Metal Products Co.

Construction Awards: War Dept. announced Oct. 6 construction awards as follows: AAF installation at Colorado Springs, Col., to cost more than $3,000,000. AAF installation at Kearney, Neb., to cost more than $3,000,000. AAF installation at Hays-Walker, Kan., to cost more than $2,000,000. AAF installation at Hereford, Arizona, to cost more than $1,000,000, and AAF installation at Grand Island, Neb., to cost more than $2,000,000.

Add Construction: War Dept. announces further construction awards. Contract has been let for AAF installation at McCook, Neb., to cost in excess of $1,000,000. Expansion of Camp Butner, Durham, N. C., has been authorized, to cost about $2,000,000.

New Gunnery School: War Dept. announced Oct. 15 a new AAF aerial gunnery school has been opened at Fort Myers, Fla. Applicants must be between the ages of 18 and 30, inclusive, with eighth grade education equivalent. Physical requirements specify five feet, 10 inch height maximum, and a weight limit of 170 lbs.

British Praise Grummans: Navy Dept. special press release stressed British praise of the British Martlet, or Grumman Wildcat. Rear Admiral A. L. St. G. Lyster, R.N., in a message to Vice-Admiral John H. Towers, U.S.N., praised performance of the RAF's Martlets during recent Mediterranean convoy operations. He said the more Grummans the Allies could get, the greater the damage which will be inflicted on the enemy.

Army Officers Assigned: Thirty-one additional officers have been assigned to coordinate the manpower needs of the Army's war contractors. These men, appointed to various regional offices of the Manpower Branch, Civilian Personnel Division, Services of Supply, will be responsible for seeing that Federal agencies provide contractors with the necessary personnel.

Short Joins Ford: Maj. Gen. Walter C. Short, retired, commanding officer of the U. S. Army's Hawaiian department at the time of Pearl Harbor, has been appointed head of the traffic department at the Ford Motor Co.'s Texas plant.

Congress Provides for 14,611 Navy Planes

Also Approves Large Carrier Building Program

By KATHERINE JOHNSEN

Both Houses of Congress have approved a $3,822,000,000 additional appropriation for Naval aviation and authorize contracts for 500,000 additional tonnage of aircraft carriers in the Second Supplemental Appropriation Bill.

A "rider" provision to the appropriation bill removes the present restriction (23) on the Navy's number of flying admirals.

The $3,822,000,000 Bureau of Aeronautics appropriation is allocated as follows:

Procurement of airplanes	$2,862,000,000
Non-rigid airships	36,330,000
Stockage of aeronautical accessories	352,567,000
Maintenance and operation	225,203,833
Transport service	25,883,700
Miscellaneous, including defense aid	320,015,467
	$3,822,000,000

The $2,862,000,000 provided will purchase 14,611 planes of many types—dive bombers, observation planes, fighters, trainers, and large land-based bombers including Consolidated B-24s. The planes presently provided for, it is revealed by Under-Secretary Forrestal, will begin coming in by the end of next year, with the major portion being completed about the middle of 1944. The program is superimposed on the Navy's announced schedule of 27,500 aircraft, but it is not expected to raise that schedule since such factors as heavy battle losses, etc., will enter the picture. A purpose of the appropriation is to insure those who are now making aircraft, for current deliveries, that there will be business for them if they continue to expand their facilities.

Cannon

A Senate amendment will provide $11,00,000 to the Interior Dept. for the development of helium facilities at Amarillo, Tex., to supply the Navy's augmented blimp program. The Bureau of the Budget had not submitted the request for helium when the bill was before the House.

The bill makes available to the Navy $9,510,000,000 for surface craft authorized by Congress a short time ago in the Naval Expansion bill. Battleships were omitted from the authorization; carrier tonnage was increased by 500,000 tons. Chairman Vinson (D., Ga.) of the Naval Affairs Committee told the House in this connection that the carrier was to be the "backbone" of the modern Navy.

Also carried in the bill is an allocation of $500,000,000 for war housing. The President requested $600,000,000.

Chairman Cannon (D., Mo.) of the Appropriations Committee who brought the naval aviation measure before the House at a time when conflicting reports on the quality of aircraft procured by our services confused members, said: ". . . the latest information from the most authoritative sources indicates that . . . American aircraft are superior to any aircraft which our armed forces will meet in battle today." He read to them a letter from Gen. George C. Marshall, Chief of Staff, to substantiate his statement.

A few days later, Chairman McKellar (D., Tenn.) of the Senate Appropriations Committee, told his group and Naval officials: ". . . for my part, I am inclined to think that the sooner and the faster we build aircraft in this country the better, and I am almost content to go sight unseen on the question of aircraft . . ."

Summary of Hearings

A digest of House and Senate Appropriations Committee hearings, officially published, shows:

Total Aircraft Program: Questioning by Committee members brought forth this summary of Navy plane appropriations:

Total of $5,766,406,962 has been appropriated for new Naval planes from fiscal 1940 to 1943 inclusive, of which there has been obligated to date $5,421,357,395, with $207,500,000 more in process of obligation. Amount actually expended through June 1942 was $971,256,804.

The rate of expenditure increases very rapidly from June 1942 throughout the fiscal year of 1943 (ending June 30, 1943).

In 1940 the appropriation was for 937 planes, totaling $69,024,000, which included some money for previous contract authorization. In 1941 appropriation was for 7,129 planes, or $286,250,562, with some money for previous contract authorization included therein. The 1942 appropriation was for 27,162 planes, with a total of $4,383,289,000, including $350,000,000 to meet previous contract authorizations. Up to the time of this supplemental appropriation bill there had been 1943 appropriation for 1,709 airplanes plus $715,000,000 for previous contract authorization, or a total of $1,027,842,800.

Most of these planes will be ordered immediately, with first deliveries about March 1, continuing through 1943-4.

Asked if the Bureau of Aeronautics' requested $3,822,000,000 will carry the Bureau through this fiscal year, Rear Admiral Towers admitted the Bureau will need more funds. The aircraft "program is being expanded upward almost every day," he said. Certainly additional funds will be required for stocks such as spare parts, engines, etc., and for maintenance.

Production Peak: for Navy aircraft will be reached about December 1943. "We are going up very rapidly now, then it levels off, increasing very slowly thereafter," an officer said. Deliveries on the old program will start falling off about Aug. 1943 after a July 1 peak. The old program was for 60,000 Army and Navy planes in 1942, calendar, and 125,000 in 1943. Of these, there were assigned 15,000 of the 1942 production quota for trainers and 25,000 trainers in 1943. These 40,000 trainers were not assigned in advance to either Army or Navy, the two services to decide on the allocations as time went on. Of combat planes, the Navy had production cognizance of 10,170 in 1942 and of 21,790 in 1943. The Navy also gets its transport planes from production cognizance of the Army, as well as a few combat planes of Army type from the Army, to avoid duplication.

Heavy Wastage

Objective of the Navy is to have on hand 27,500 planes, all of which are appropriated for, but officials say there is a "very heavy wastage" (obsolescence and crack-ups) so that the "total number of planes on hand or on order now, to meet the objective of 27,500 early in 1944 would have to be very much greater than 27,500."

Army and Navy Sponsorship: Explaining Army and Navy cognizance, Comdr. Anderson told the Committee: "Early in the program, certain airplane plants were turned over to Army cognizance and certain plants to Navy cognizance. Among the Navy plants was Pratt & Whitney. The British use Pratt & Whitney engines in many of their own airplanes . . . When they need Pratt & Whitneys they put in a requisition and because those plants are under our cognizance, we have to finance them from the Navy's side of it. So that these engines and accessories and propellers that you see in here (appropriation request) are to cover the financing . . . which the British requisition and which are produced from plants of Navy cognizance. The Army will come to you in their appropriations . . . for funds to cover British requisitions from Wright Aeronautical or Allison or Packard, which are under Army cognizance."

Big Capacity for Aircraft Industry: "We have found the aircraft manufacturers can produce more planes than even they thought they could," Adm. Towers asserted. "We have not gotten anywhere near up toward the peak." Towers said the Navy is not greatly handicapped at this time by any industrial disturbances in aircraft production.

Blimps: With regard to the airship allocation, Undersecretary Forrestal reported to the Senate Appropriations Committee that the Navy now has 23 blimps in service operating from 8 stations and 128 additional under construction. Indications are that the blimps will be valuable in patrol because they can hover "but there have not been enough of them in action as yet to offer conclusive testimony as to their effectiveness", he stated, adding that all blimps are equipped with depth bombs.

McKellar

At House hearings, the testimony of Adm. Towers did not coincide, however.

Rep. Ludlow (D., Ind.) asked: "How is the (non-rigid airship) program coming along, and how valuable is the non-rigid airship going to be in actual service?"

Adm. Towers replied: "The non-rigid airship is used for anti-submarine patrol work, and it has been extremely valuable. It has some advantages over the airplane in that work." Under the new estimate 72 blimps for anti-sub patrol work are requested and 24 for training purposes. "That will give us about 12[illegible] patrol airships, 12 at each of 10 different stations," Towers said. "We are building them quite rapidly."

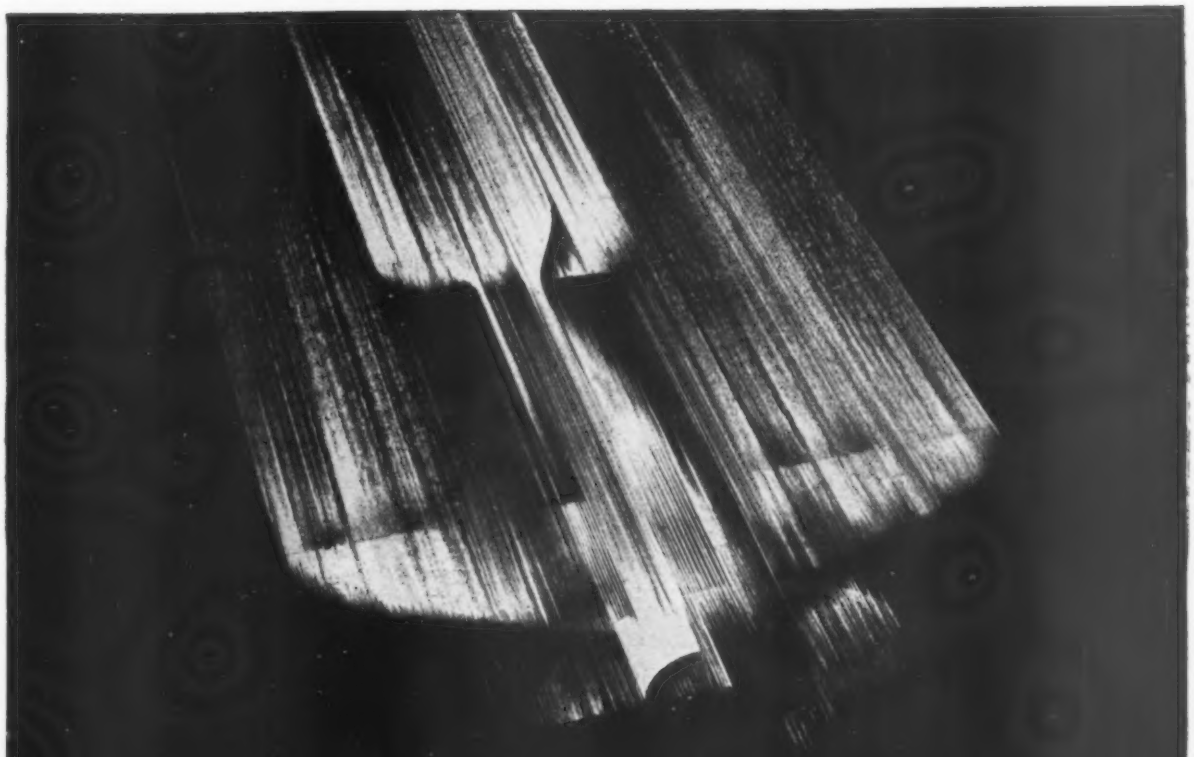
Additional Flag Rank Officers: A total of 43 flying admirals will be in service in 1943 if the provision, removing the restriction of 23 flag officers who can receive flight pay, carries, Forrestal stated at Senate hearings.

At House hearings Adm. Towers told committeemen:

"At the present time (Sept. 24) we have 18 flag officers on aviation duty. There are 13 more billets that have been established and officers have been selected and are awaiting promotions to allow them to fill those billets, and that would make a total of 31. There are eight more on top of that which have been approved, to be put into effect between the first of January and the 30th of June. That figure probably will be changed upward. It is impossible to predict the exact number, and we strongly recommend that the restrictive language be left out, because it affects the Navy Dept. in an administrative way. It is not applied to the Marine Corps or the Army.

"I think one of the ideas in doing that—I was not around when they started applying that restrictive language—but I think one of the ideas was to prevent any move on the part of the Navy Dept. to transfer to aviation any higher ranking officers. That has not been done

(Turn to page 26)



New Finishes for Aircraft Plywood

NEW finishing systems for aircraft plywood are giving aircraft manufacturers new production problems. One of the major problems is that of effective finishes. Finishing systems must have minimum weight, production speed in application, resistance to the invasion of moisture, protection against extreme changes in temperature and durability against the ravages of vibration.

Research Report Issued

Ault & Wiborg Corporation has just completed a report on an extensive research into plywood finishing. The technical information in this report will be of interest to aircraft manufacturers who are turning to plywood.

Complete finishing systems have been developed and finished plywood has undergone severe tests, some of them for a period of several years. The systems are adapted to specific requirements differing for each of the woods used—birch, mahogany, fir, poplar, spruce.

Finishes Developed for Aircraft Manufacturers

The development of both materials and finishing systems has been conducted in close cooperation with some of the leading aircraft manufacturers.

The method of application can be varied to fit the production procedure and available equipment. The systems developed by Ault & Wiborg depend upon the nature of the wood used in fabricating the panels. A typical system might employ a clear sealer, a filler (on open-grained wood only), a pigmented sealer and finally a camouflage enamel. The problem of camouflage materials for all types of protective coatings has been a primary A & W project.

SEND FOR COPY OF THIS REPORT ON AIRCRAFT PLYWOOD FINISHES

A copy of the A & W Aircraft Plywood Finishes report is available to aircraft manufacturers or prime contractors who are directly involved in the production of plywood aircraft.

Write to Ault & Wiborg Corporation, Aeronautical Division, 75 Varick Street, New York City, New York.

IT'S A FIGHT TO THE FINISH!

Ault & Wiborg finishes are now being used for shells, bombs, gas masks, expeditionary containers, aircraft wiring systems, machine tools, camouflage purposes.

AERONAUTICAL DIVISION

AULT & WIBORG CORPORATION

A SUBSIDIARY OF INTERCHEMICAL CORPORATION

War Speeds CAA Projects

Projects of CAA's technical development division have been speeded up by the impetus of war needs, according to a recent CAA progress report.

Among the more important of these is a seadrome day marker, to help prevent accidents to flying boats in tropical waters. The markers are anchored so as to keep them always vertical. They are similar to those used for seadrome night markers, and carry distinctive symbols, set on standards six to nine feet above the water level. The symbols consist of a circle and a triangle, which give the pilot an outline view from all angles. Made of plywood, covered with rubber, these devices also have small reflectors for night use. Lights can also be installed which can be controlled by radio.

Another significant development is the ultra high frequency two course radio range, combining simultaneous voice communication and sector identification. Voice signals are superimposed on the range signals. A visual indicator guides the pilot on his course. CAA reports this instrument ready for installation.

To reduce hazards, experiments are being made on a de-iceable windshield, which will also be strong enough, while plane is in flight, to stand the impact of large birds.

Stall Warning Device

Other protective devices are discussed: "Training planes will benefit from a simple and highly effective stall warning device developed . . . to prevent the most common of accidents during training."

Also, "Simple and less expensive radio fan marker monitors . . . are ready for installation throughout the airways system. These consist of simple receivers placed halfway between the marker and the airport, which give a continuous signal . . . If it fails, a siren signal is set off in the airport and a repairman is dispatched at once to the marker site to put it in operation again.

"Inaccessible radio facilities, and remote weather and traffic control posts are now 'under the thumb' of CAA men in the field, through the use of radio teletype circuits and controls operated on a frequency modulation system. Remote range stations on mountains and islands . . . are turned on and off by remote control . . ."

It adds that "new obstruction markers for warning pilots of the presence of high towers or buildings are in operation . . . These are small radio transmitters which give the pilot a distinctive signal in his earphones and in lights on his dashboard . . .

"An automatic radio range monitor is now under development which not only warns the CAA airways worker . . . but also sends a distinctive aural warning to the pilot . . ."

14,611 Navy Planes Provided

(Continued from page 24)

for many years . . . I urgently recommend that the language suggested in the (Navy) Secretary's letter which has been submitted to the committee be accepted by the Committee." (Restriction removed).

Pilots: Adm. Towers reported that the Navy now has considerably more pilots than are required for its minimum needs.

Rear Admiral R. E. Davison told Senators that the entrance rate of prospective Naval pilots now is 1,900 a month and that all are coming through the CPT program. Next year the Navy plans to train at least 30,000 pilots through CPT. Complete training period (including CPT) for Naval aviators is 11 months. "We find that we are getting about 20% higher acceptance from that class (with CPT) than those starting ab initio in our own training", Davison reported.

Use of Spitfires: Chairman Cannon said: "We were discussing . . . the use of Spitfires by American-type pilots in recent operations . . . One explanation which we have been given, which was not given us at the time the testimony was taken here this afternoon, was that of the special equipment and the ground crews and service for Spitfires, which were there (in England), but they were not there for our planes; that it was not the superiority of the Spitfire over our plane, but that the equipment was there, etc." Towers replied: "That is an Army Air Force matter, but I do know that they got a number of American-type planes over there before they got any large quantities of spare parts and before they had much of their general maintenance and overhaul facilities set up." Cannon asked: "In your opinion, that accounts for the use of the Spitfires instead of our own aircraft?" Towers replied, "Partly, undoubtedly . . ."

Carriers: A Congressman asked Towers if it is "necessary that Carriers be as large as they are?" Towers said: "I think so." The Congressman pointed out that "It makes them a great target—their size." Towers said "That is correct, but it also gives them much more protection. They can take much more punishment, and they can operate more airplanes. The small carrier does not really pay; it is not an economy."

Helicopters for Coast Guard: The Coast Guard is obtaining two "helicopters" from the Army, according to Adm. Waesche. "Use of helicopters has been considered for some time by the military services and we feel that helicopters will be of great use to us in the anti-submarine patrol along the coast. They can hover over the water, similar to a dirigible, and we are getting these two as an experiment to aid us in the anti-submarine patrol, and beach patrol . . . The Army was going to buy a number of these helicopters and has agreed to allocate two of them to the Coast Guard.

Amphibian and Training Gliders: Rep. Scrugham (D., Nev.) commmented on lack of amphibian gliders, as well as "extreme dangers" of such operations. . . . "I came to the conclusion that the glider was apparently being neglected by the Navy, particularly the amphibian glider."

Adm. Towers said: "The Marines, of course, have a need for gliders for use in connection with landing operations. It was not until fairly recently that the need was recognized. We immediately established a glider school at Parris Island in South Carolina. We sent out a party to inspect sites and are in process of establishing two other glider schools, one in North Carolina and one in Texas. We bought a considerable number of training gliders and placed quite a number of contracts for amphibian gliders. (In fact) we already have funds and have placed orders for several hundred. They will cost about $20,000 (each) . . . but of course we have to have a lot of instruments on them. They are big gliders. We are buying two principal types, one a 12-place and the other a 24-place glider. . . . We have made some training gliders by taking the engines out of planes." There are no glider funds in this new bill. Towers said the Navy has several hundred of the 12- and 24-place gliders on order for the Marines.

Aircraft Ammunition: There are no shortages except in aircraft torpedoes, Adm. Davison claimed.

Naval Reserve Aviation Bases: are now at Memphis, Tenn., at Peru, Ind., Norman, Okla., and two in Kansas, Rear Admiral E. T. Allen stated.

Number of Plane Types: Asked if "you are warranted in producing so many different types" of aircraft, Towers said: "Yes. We have not been able to meet the needs of the rapidly expanding operating forces."

Experimental Flying to New Base: Adm. Towers said "We propose to concentrate at Cedar Point, (Md.) practically all of our experimental flying activities. Some of them are now at Anacostia, some at Philadelphia, some at Newport, Norfolk and Dahlgren.

Foreign Squadron Here: Asked if a $1,933,300 item is a lend-lease item, Towers said "No, sir. That is a squadron that was assigned to our operating force. They are operating over here under our command, and for that reason it was not put under lend-lease."

Contract Transport Service: Requested an explanation on $25,883,700 for contract transport service, Towers said: "The Navy is utilizing, to the fullest extent, the equipment which the company or companies (not specified) had on hand at the time they made this contract. We took over the planes but they did not give up all of their base facilities." The service is on a cost basis, plus a fixed fee. . . . An estimate of total cost of $456,000 was arrived at. Contract is not yet signed."

Civil Air Patrol Cadets Organized

Formation of the Civil Air Patrol Cadets, a young people's volunteer aviation corps, was announced Oct. 9 by James M. Landis, Director of the Office of Civilian Defense.

CAPC will parallel the organization and activities of the senior Civil Air Patrol. Purpose of the new set-up is to extend the same training opportunity to youths as exists for the senior group. "Thus CAP can double its strength by making a junior copy of itself" according to the Washington announcement.

Membership in CAPC will be limited to native-born students in the last, or next to last, year of senior high school. Volunteers will not be assigned to any flying duties. Upon completion of cadet training and graduation from high school they will become eligible for full membership in the senior Patrol. A minimum age of 18 is required for flying assignments.

Like members of the senior group, cadets will learn navigation, meteorology, radio and other aviation subjects. They will also be trained in defense subjects such as first aid, gas protection and code signaling. Because of these preparations, graduates who go on to the armed forces will have preliminary qualifications for almost any branch of the services to which they are assigned, CAP states.

Number of local CAPC units will be limited for the immediate future to about 1,000, the number of active CAP units in the country. A "local unit" will consist of a Squadron Command, with subordinate Flights at outlying airports. Each Squadron will have a Commanding Officer, Executive Officer, Intelligence Officer, Training Officer and Communications Officer.

Eight-Hour Law Suspended for Work on CAA Projects

Difficulty in obtaining labor for work on CAA projects directly related to the war effort has prompted Charles I. Stanton, CAA administrator, to ask for relief from the Government's eight-hour law, so that mechanics can work more than eight hours a day and receive extra pay for such work. An Executive Order from the White House has granted this relief.

"There is an acute shortage of such labor in the market, and the few qualified men who are available prefer employment with private contractors who can pay overtime rates which the Administration is prohibited from paying," Stanton pointed out in making his request to the Secretary of Commerce. "Accordingly, the Executive Order suspending the existing eight-hour law so that Administration laborers and mechanics could work more than eight hours a day, and receive not less than time and a half pay for all such overtime work, was proposed."

AIR COMMERCE IN A NEW WORLD

World-wide warfare has given present day map makers a new conception of our globe.

In Polar maps they show us a world in new perspective, a world in which the Arctic Circle is the common meeting ground for North America, Europe and Asia. This Arctic area atop the world is relatively small. It presents no great obstacle to modern-day aircraft. By air routes over this area great capitals are brought *days* closer together.

New York to Chungking, for instance, by a route over the North Pole is just 7,650 statute miles. The most used surface route from New York to Chungking, before war made it vastly longer, was 11,964 statute miles—4,314 miles longer than the trans-Polar air route!

Flying new airways in this new world, an even swifter and more economical air commerce will bring the peoples of the world together in ever-greater numbers. By the chemistry of aviation, races and ideas now alien will be blended to establish a firm basis for a lasting peace.

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Fortnightly Review

(Continued from page 1)

airplane on all fronts, especially the bombing of cities and supply bases. Another is the series of reports out of Washington, climaxed by the OWI report, which keep airpower on the front pages. And on the editorial front we have land-bound columnists like Walter Lippmann who are now saying that perhaps the ground forces should be under the command of air chiefs and used as supplementary fighting units to airpower. The trend is right.

2. *On the Fronts.* The Army Air Forces is now doing a job which even many in aviation a year ago would have said wasn't possible at this stage of the war. Airmen are fighting on nine distinct and separate fronts every day and every hour. The logistics of supplying nine fronts at once are staggering, but somehow the AAF is doing a superb job from Egypt, England and Iceland to the east of us, and from Australia, New Caledonia, New Guinea, China, the Solomons and the Aleutians to the west. The AAF is standing up magnificently under the toughest world-wide fighting assignment ever given any group of men. The crystallization of action on these nine fronts has been a progressively uplifting factor in the airpower position.

3. *Production.* Aircraft manufacturers are still not getting *enough* material to utilize the productive capacity of the nation's plants, but the *share* these manufacturers are getting from the critical material available is substantially better than it was six and eight months ago. The situation has improved within the past sixty days. Certainly it cannot be said that the material situation has been solved—far from it—but it has improved as far as aviation is concerned. The pie of critical materials isn't larger, but aviation's piece of this pie is larger. This is a distinct improvement, reflecting greater recognition of airpower at the top.

4. *Training.* Within the past sixty days the Army has decided to utilize all of the existing civilian aviation training facilities. Its decision came very late and only after much pressure had been exerted. Meanwhile a substantial amount of civilian training facilities and personnel had drained away, but it is comforting that the residue is now being utilized for military purposes. Such utilization can definitely be placed on the credit side of the ledger, and is one more of the many irksome knots untangled within recent days.

Of course there are less encouraging factors offsetting the four improvements noted above, uppermost of which is perhaps the problem of manpower. Nothing short of a White House executive order will do the trick. Replacement of manpower in the aircraft industry is a foregone conclusion, but the maintenance of production standards and output is entirely dependent upon the manner in which this replacement takes place. It must be accomplished orderly and intelligently. Skilled *supervisory* personnel must be retained or production will suffer immeasurably.

On the whole, however, the general picture has improved materially within the past month. A certain "lift" was noticeable in the national capital. The topside signs that airpower is achieving the position it needs in this war are the most heartening since the war began. Airpower is our one offensive weapon. It can do the job. It can do the job if the tools and the freedom of direction and operation are at its own command.

Between Two Extremes

THE report on the performance of American military and naval aircraft prepared by the Office of War Information, and carried in full in this issue of the magazine, is a masterpiece of fairness, restraint, and balance. It is a far cry from the typical cold and dogmatic government report. It is a human document that endeavors to blend the good and the bad about our aircraft with an appeal to Americans to consider all angles before leaping to conclusions.

The industry surely will find no fault with this report. On the other hand, the report will find its own reflections in sounder newspaper articles and more sensible and intelligent radio newscasts. OWI assigned an able man to prepare the report and the result is a credit to the increasingly popular agency directed by Elmer Davis. It is strongly recommended that the report be read and digested in full. There are no conclusions on which accurately to base newspaper headlines. As to whether our planes are inferior or superior, the OWI report merely says, "the truth lies between the two extremes," and then endeavors to present as fair an appraisal as could reasonably be expected from any investigator.

Inwood Returns to Industry

AFTER more than seven years in public service, Louis R. Inwood is returning to private industry this month when he joins TWA, Inc. Few public servants have labored so untiringly and so well. Many are the battles he has fought on behalf of aviation and his accomplishments have been far more numerous than are generally known. While with the Air Mail Bureau of the Interstate Commerce Commission, Inwood was the examiner responsible for the famous AM Docket 19 which was the first proceeding to establish the fact that the receipts of the Post Office Department were in excess of the amounts paid to carriers for air mail carriage. During the past two years he has assisted in planning materials distribution for aircraft producers, and handled the allocation of aircraft engines and propellers to the airlines until the direction of the airlines was taken over by the Air Transport Command. He has been an able champion of aviation in the government service and we wish him well on his return to industry.

Slip on the Blueprint

A CERTAIN new large aircraft plant "somewhere in the southwest" is boasting today that it's the largest aircraft plant in the nation only because of a draftsman's slip. An exact duplicate of this plant has been constructed in a neighboring state, but a draftsman mis-read one foot to read one inch at one spot on the blueprints, and as a consequence, the first plant is exactly 4,000 feet long and the duplicate is 3,999 feet and one inch, just eleven inches shorter. There is no moral in this story except one of state and industrial pride in having the biggest. Incidentally, the plant we're talking about exceeds the much-publicized Willow Run plant of Henry Ford, and visitors are taken through it on a motor scooter at 25 miles per hour. The Axis would get a royal headache from seeing some of the magnificent new ultra-modern aircraft plants and some day we hope censorship restrictions will permit our telling about them.

Cargoliners and Transporters

INCREASED emphasis on transportation by air in the war is bringing new names into use to describe transport or cargo airplanes. Prime Minister Winston Churchill recently called them "transporters," and United Air Lines has used the expression "cargoliners" in recent advertisements. Just as the word "airliner" was coined at the start of commercial air passenger service, the future designation of large transports or cargo planes is being coined. It will be interesting to see which of the above, or perhaps another similar expression, will "catch on" and become part of every-day language.

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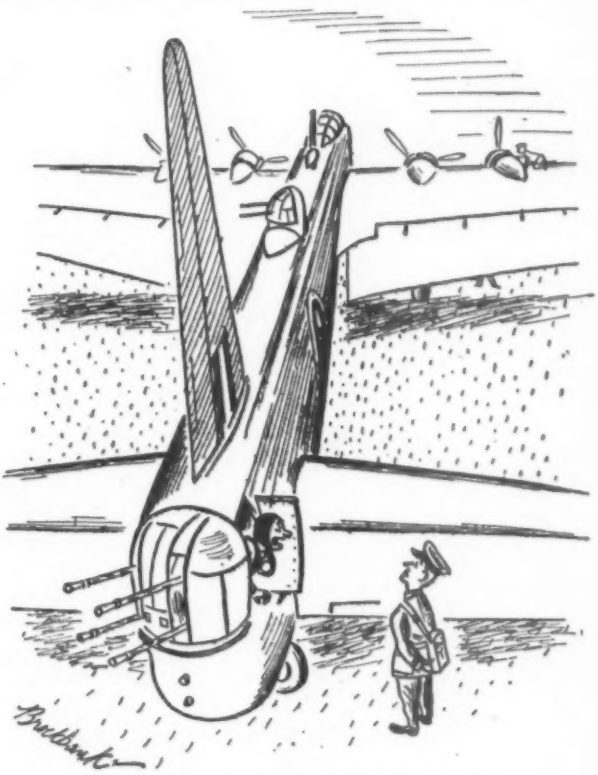

"Just hang on, and I'll see if he's in."

from The Aeroplane.

Letters

A Pilot Protests

Chicago, Ill.

Since your magazine is an organ of fact and truth, printing it without fear or favor, it might be of interest to your many readers to have some light shed on a current aviation controversy.

All airline carriers participating in cargo runs for the Army have used this theme to great advantage in their full page ads, seeking a cloak of glory by taking credit for a job well done. Pictures of airliners flying supplies all over the world are seen with no explanation of who flew them there.

Airline pilots, in the main, are not glory seekers. They realize that the Air Transport Association of America, as represented by all the carriers, has a definite place and duty in the cargo contracts with the Army, but with limitations.

There is a move on at present by ATA to reduce airline pilots' wages and standards of working conditions under the guise of patriotism. It should be pointed out that these pilots have asked no increase in pay even though the cost of living and inflation have made inroads on their living conditions. Now, when all other industry has boosted wages to keep in step with costs, the ATA is asking that airline pilots fly to the four corners of the globe for less money than was being paid for the same job in peace time. With the added dangers of a war mission, the pilots are accused of sabotaging the war effort if they do not agree to the terms as outlined by ATA. The reason given (an excuse) for wanting to pay less, is that younger flyers will be doing the job. It should be pointed out that a man has only one life, be he young or old, with thousands or hundreds of flying hours. The individual's pilot safety is just as important to him as any carrier official's is to him.

With the ever-increasing demand for air transport service in the armed forces, it will be the lot of the airline pilots to get the job done. Under extreme weather conditions, plus military risks, this duty becomes more than just a chore. Cargo ships are being loaded far beyond the maximum weight limit as specified by the manufacturers. The pilots are ordered to warn any and all officials who might be riding an overloaded ship, so that they may seek other means of transportation. The pilot is expected to deliver the goods on such an overloaded ship or be subjected to the criticism of the deplaning official of "sabotaging the war effort."

The combined strength of ATA is being used to break down the standards and pay of pilots while seeking to divert all the glory to its halo of patriotism.

If any publicity is given the forthcoming wage fight, we the pilots know your unbiased magazine will, as always, give the readers a true picture.

An Airline Pilot

Bookshelf

BILLY MITCHELL: FOUNDER OF OUR AIR FORCE AND PROPHET WITHOUT HONOR. By Emile Gauvreau and Lester Cohen. 304 pp. E. P. Dutton & Co., New York. $2.50.

The great late Billy Mitchell would turn in his grave if he could read this book by the former editor of the defunct tabloid *New York Graphic*. The title is grossly misleading. It is a sorry tribute to the prophet of airpower. Actually Billy Mitchell is only a cover for the patent claims of James V. Martin. By no stretch of the imagination is it a genuine book about Billy Mitchell. Not only that, but it's poorly written throughout. It isn't even good muckraking. The way is still wide open for a good Mitchell book.

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THE FLYING TIGERS—The Story of the American Volunteer Group, by Russell Whelan. The Viking Press, Inc., 18 East 48th Street, New York City. Illustrated. 224 pp. $2.50.

This is the story based on the realization of the dreams of two men—Clair L. Chennault and Generalissimo Chiang Kai-Shek. And it is the story of the courage, skill and faith of the 250 American members of the American Volunteer Group who quietly left the United States in the mid-summer and fall of 1941.

With the brilliant aerial defense of the city of Rangoon on Christmas Day 1941, the dream began to come into focus; for that day the Japanese air raiders were officially and disastrously introduced to the A. V. G. pilots—the Flying Tigers, as the press and radio were soon to tell the world.

This is the story of a theory and a belief—Chennault's—that worked in practice. Eighteen against 80. Five against 40. Under the guidance of the "Old Man," they developed individual air combat to its highest perfection, and turned a hopeless situation into a great victory.

Like W. L. White's *They Were Expendable*, Mr. Whelan's book packs the same wallop, the same lump in the throat, the same grin at young deviltry. And like White's book, the story which Mr. Whelan has to tell "belongs" to the men and tells itself. It suffers in no way from author instrusion.

—J. G.

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AVIATION DICTIONARY AND REFERENCE GUIDE, SECOND EDITION 1942. By Harold E. Baughman. Aero Publishers, Inc., 120 North Central Ave., Glendale, Cal. 906 pp. $6.50.

The second edition of this immensely valuable book has even more information within its covers than the first, if that is possible. It is not merely a dictionary of aeronautical terms, although this is perhaps its most important feature. It includes a vast amount of other useful information, such as civil air regulations, meteorological data, a reference guide on design and shop production and useful tables and factory shop safety rules. There is also a comprehensive index and miscellaneous information. Mr. Baughman's careful work has become one of the "must" reference books of aviation.

—W. W. P.

Rails Urged to Foster Air Cargo for Use in Post-War Period

Carriage by Air of High-Grade Goods Seen

By Eric Bramley

U. S. RAILROADS should weld themselves together to foster air transportation for the movement of high-grade merchandise traffic as a subsidiary to mass rail transportation, superimposing an air freight carrier on the present rail organization.

Transportation of freight by air is "on the way" and will forcibly establish itself during the post-war era.

These are conclusions reached in a significant report prepared recently by the research and development bureau of the Illinois Central System.

Before U. S. entry into the war several railroads were on the verge of announcing an "air-rail" company. Declaration of war, however, postponed this plan. The ICS report indicates that the railroads' interest in air freight continues.

The report lists "four dynamic factors" which indicate the present trend and future potentialities of air transport as a freight carrier: (1) the phenomenal growth of U. S. air express during the past 11 years, in spite of the fact that the nation has the finest surface transportation in the world; (2) air express and freight operations carried on all over the world have far passed the experimental stage; (3) the war will provide a vast number of pilots and planes for air freight, and (4) new planes will be able to carry heavier loads more economically.

On the last point, the study said: "The war pressure on plane design and construction will bring about many improvements which will be of inestimable benefit to post-war airline operations. New theories in aerodynamics can safely be expected to come forth, enabling airplanes to achieve an upward rise in payload ratios as contrasted with present-day cargo capacities.

"Increased efficiencies in engine power will make it possible to fly greater weights. The aircraft industry now claims that planes can be constructed that can carry 20 tons at high altitudes and on long distance flights. As a matter of fact, present-day war bombers now carry load weights which would have been unthinkable as little as five years ago.

Lower Costs

"All of these potential developments, which now are in the process of unraveling, form the last factor which will exert a dominating influence on lowering operating costs, a fact which will greatly stimulate the future expansion of air freight transportation in this country, by acting to reduce rates."

At the present time, the report asserted, air express costs eight times as much as railway express and 16 times as much as the average of the combined first and second class LCL freight from Chicago to San Francisco. From Chicago to Memphis air express costs six times as much as railway express and 13 times as much as both classes of LCL freight, and to New Orleans eight times as much as railway express and 16 times as much as LCL freight.

Express Affected

"Obviously, the first kind of rail business that will be affected by low-cost air freight competition is that no moving via railway express where the present rates from Chicago to Omaha and Memphis, for example, average 13.4c per ton-mile," it continued. "With 1st and 2d class LCL freight rates ranging from 3.3 to 6.6c per ton-mile, a reduction in air freight rates equivalent to more than 90% below the present level of air express rates will be necessary before aircraft service can effectively compete with rail LCL merchandise freight on a cost basis.

"Besides being very costly compared to competing modes of transportation, present air express rates seem to disregard the 'tapering principle,' for instead of the rate per ton-mile decreasing as the length of haul increases, it places a penalty on the long hauls . . ."

Export to Fly South Atlantic During Winte

American Export Airlines has received permission from the Civil Aeronautics Board to conduct operations this winter between New York and Foynes, Irish Free State, over the south Atlantic via Bathurst, Gambia, and Port of Spain, Trinidad, westbound, and via Bermuda eastbound.

The period covered by the CAB order is from Nov. 1, 1942 to May 31, 1943.

CAB said Export believes that "the natural adverse weather in the north Atlantic Ocean during the winter months, the lack of adequate weather information, and the fact that the prevailing winds are from west to east would impair the efficiency of applicant's operation if operated via the north Atlantic..."

Operations proposed by Export, CAB added, "would involve comparatively minor capital expenditures and additional operating expenses which would be offset by additional revenues accruing because of increased payloads and the addition of traffic to and from the intermediate points."

Francis to PAA

Devon Francis has resigned from *Time* Magazine to join Pan American Airways as assistant to the director of public relations. Francis was former aviation editor of The Associated Press.

Braniff Suspends Stop

Braniff Airways has been granted permission by CAB to suspend service temporarily to and from Ponca City, Okla.

AWTI: Left photo shows headquarters of the Airlines War Training Institute, at 1616 K St., NW, Washington, D. C. The Institute, which is undertaking the training of thousands of pilots, navigators, mechanics, etc., occupies all four floors of the building. Shown above are Samuel J. Solomon (center), president of Northeast Airlines and director of AWTI; Jerome Lederer (left), formerly head of CAB's safety bureau, now Solomon's executive assistant, and Clarence Belinn, vice-president of Hawaiian Airlines, in charge of AWTI's mechanic training. Exact number of men and women to be trained has not been officially announced.

The B.F. Goodrich Airplane of the month
NORTH AMERICAN B-25
JAPAN WON'T FORGET its visit from the B-25's. You can be sure of that! And these fighter-fast bombers will strike again . . . wherever the Army commands. That's a promise made by the manufacturer, North American Aviation. Leading military planes are supplied with B. F. Goodrich products . . . De-Icers, so they can fight the enemy and forget the weather . . . Silvertown Tires and Expander Tube brakes for greater safety . . . and other important rubber and synthetic rubber parts. This month, B. F. Goodrich salutes North American and nominates the B-25 Bomber as Plane-of-the-Month.
In war or peace
B.F.Goodrich
FIRST IN RUBBER

B.F. GOODRICH RUBBER RESEARCH FOR THE *Aviation industry*

De-Icer slide films are valuable aids in visual training programs

TO HELP in the task of passing the "know-how" about De-Icers along to your personnel, B. F. Goodrich offers a group of four reading slide films. These four 35-mm. films, together with booklet editions of each film, are available for Army and Navy training centers, schools, airlines and aircraft manufacturers.

"The Development of the De-Icer" gives a brief explanation of: the causes and conditions of aircraft icing, what De-Icers are and how they operate. This short film shows the need for complete protection from ice.

"De-Icer Servicing and Installation" shows the various steps in removing, repairing, storing and re-installing De-Icers. Maintenance personnel will like the assistance this film gives when working on De-Icers.

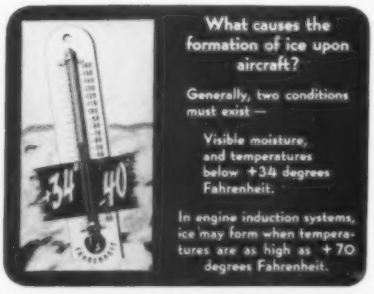
"De-Icer Operation" contains specific information for pilots, and other flight personnel on matters concerning De-Icer operation. This film is now in preparation.

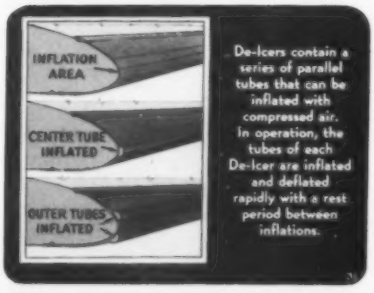
"De-Icer and Design" illustrates in detail the various types of De-Icers, methods of installation, attachment devices and the air supply system. It will assist aircraft production personnel—designers and engineers—when they incorporate B. F. Goodrich De-Icers in future planes.

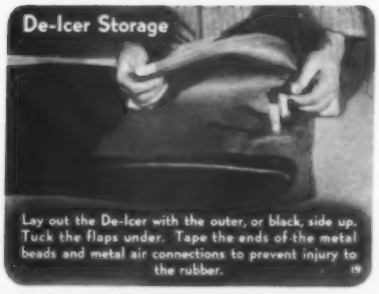
LET'S GO! U.S.A. · KEEP 'EM FLYING!

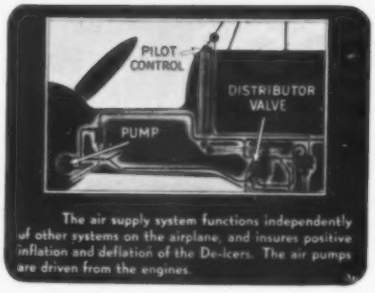
MAKERS OF B. F. GOODRICH TIRES AND OVER 80 RUBBER AND SYNTHETIC RUBBER PRODUCTS FOR AIRPLANES

THESE *Excerpts from the films* ILLUSTRATE THEIR VALUE TO AIRCRAFT PERSONNEL


What causes the formation of ice upon aircraft?
Generally, two conditions must exist —
Visible moisture, and temperatures below +34 degrees Fahrenheit.
In engine induction systems, ice may form when temperatures are as high as +70 degrees Fahrenheit.
+34
40


INFLATION AREA
CENTER TUBE INFLATED
OUTER TUBES INFLATED
De-Icers contain a series of parallel tubes that can be inflated with compressed air. In operation, the tubes of each De-Icer are inflated and deflated rapidly with a rest period between inflations.


De-Icer Storage
Lay out the De-Icer with the outer, or black, side up. Tuck the flaps under. Tape the ends of the metal beads and metal air connections to prevent injury to the rubber.


PILOT CONTROL
DISTRIBUTOR VALVE
PUMP
The air supply system functions independently of other systems on the airplane, and insures positive inflation and deflation of the De-Icers. The air pumps are driven from the engines.

Installing New De-Icers
To prepare the airplane for new De-Icers, apply adhesive tape over all skin laps and rivet heads in the De-Icer area to prevent localized wear on the undersurface of the rubber. Around salt water use a coat of P-27 primer on the skin under the De-Icer.

BOOKLET RÉSUMÉS

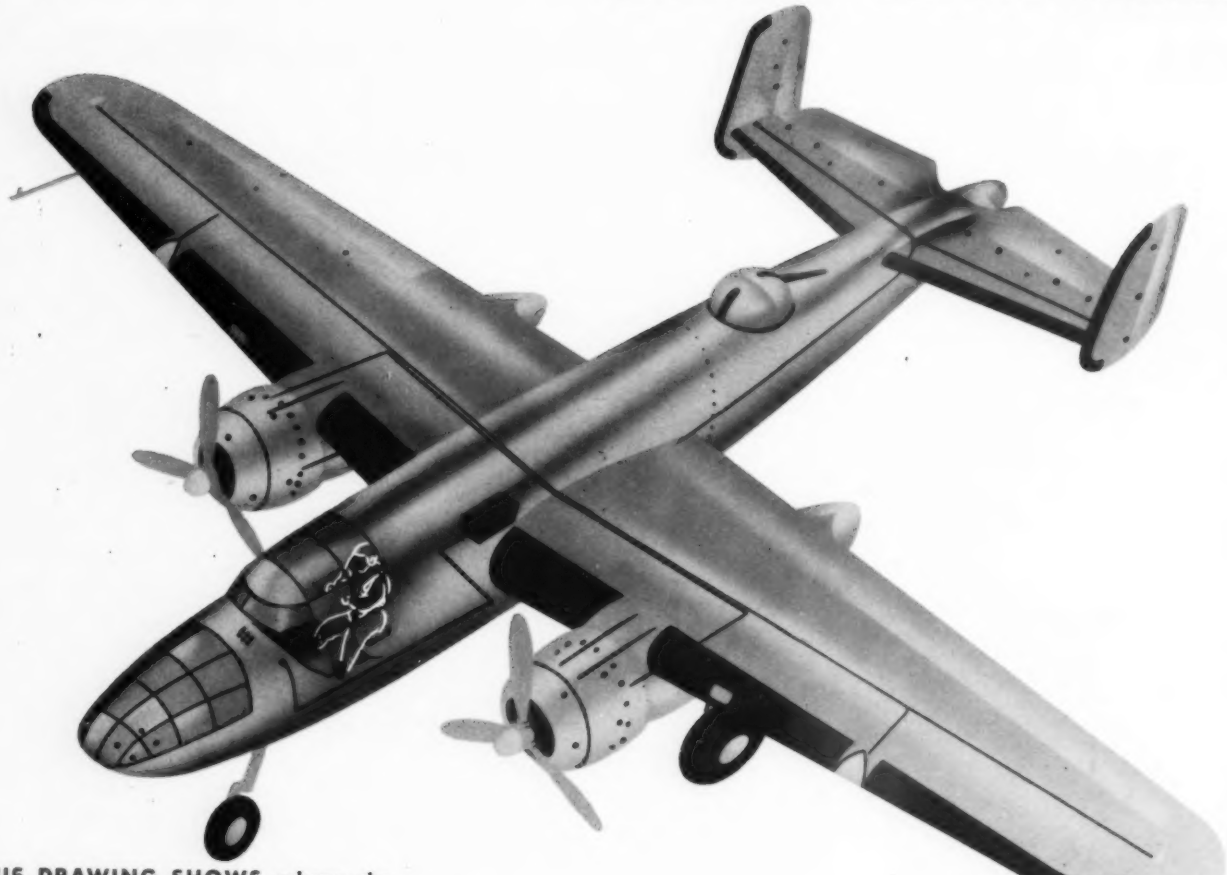
We have prepared pocket-sized booklet editions of the slide films. The booklets contain all of the individual pictures and accompanying reading text from the films. If you are now using the films as part of a regular instruction course, you will appreciate the opportunities these pocket-size booklets afford in further establishing De-Icer principles. We suggest you distribute copies of the booklet edition of the films to members of the audience for individual study.

HOW TO ORDER

Both the films and booklets are available without cost to qualified persons in the aeronautical industry who send in their requests on a company letterhead. When requesting the films, please tell us how many copies of the booklets you can use to advantage. Write to the B. F. Goodrich Company, Department 7191, Akron, Ohio.

In war or peace
B.F.Goodrich
FIRST IN RUBBER

From the B. F. Goodrich Notebook



THIS DRAWING SHOWS where the B. F. Goodrich products are on a typical medium bomber. You will be able to distinguish everything from grommets to the De-Icers on the leading edge of the wings. In addition, bullet-sealing fuel tanks, carefully concealed for military reasons, are located in the plane.

B. F. GOODRICH SILVERTOWN TIRES help a student pilot achieve safer, smoother landings—thus building his confidence. You'll find tires bearing the famous name, Silvertown, on planes of all sizes, from primary trainers to huge 4-motor bombers, and on commercial planes and private planes as well. They help immeasurably to "Keep 'Em Flying"!

B.F.GOODRICH
General Offices
Akron, Ohio

TWA, Braniff Show 1st Half Profits Despite Operation of Less Equipment

Despite depleted transport fleets, TWA and Braniff Airways showed net incomes of $498,216 and $214,993, respectively, for the first six months of 1942.

TWA, in a brief release, stated that its favorable results are explained "in large part by a continued heavy traffic volume accommodated on a lesser number of flights than were operated last year."

In the first six months of 1941, TWA had a loss of $693,048.99. Its profit for the first half of 1942 represents earnings of 52c per share, as compared with a loss of 73c a share for the same 1941 period.

The greatest actual increase in revenues was derived from passenger traffic, although a much larger percentage growth was noted in revenues from express traffic, the company stated. It did not quote figures.

Braniff's $214,993 profit compared with a loss of $138,817 in the corresponding period of 1941.

"These statements give effect to the decision of the Civil Aeronautics Board on our petition for increased mail rates which has been pending since Oct. 9, 1941 . . .," T. E. Braniff, president, said.

Deficit Eliminated

"The operating deficit of $237,678 shown in my last annual report has been entirely eliminated and an earned surplus of $66,032 is shown as a result of the application of retroactive mail pay based upon rates prescribed in CAB's decision, which are 29.58c per mile from Oct. 9, 1941 to May 31, 1942, applicable to mail flights only, and 24.83c per miles thereafter on all mail schedules operated . . .

"Certain proceeds from the sale of equipment to the government, for which payment had not been received, are not included in our June 30 statement, but will be included in our annual report."

Braniff's flight equipment was reduced from 16 to seven units as of June 1, 1942, Mr. Braniff explained, adding that in spite of this income from passenger traffic is running slightly in excess of the corresponding period of last year.

Use 7 Planes

"In other words," he said, "we are now doing more passenger business with seven planes than we did during the corresponding period last year with 16 planes. Greater demand for space and increased hours of service per airplane have been the principal factors contributing to this result. Were we able to secure replacement of the planes diverted to the war effort, it is probable they too could be operated in our commercial service without impairment of our present load factors . . .

"Substantial changes in personnel have occurred as a result of the war. Men trained in aviation are in great demand, and some of our valuable executives and technicians entered active military service, either as the result of being called to fulfill their obligations as members of the Army and Navy Reserve Corps or to accept officers' commissions. Selective Service has likewise made heavy inroads . . .

Prospects Favorable

"Current prospects for increased volume of business are decidedly favorable. The opportunity which has been afforded us to participate actively in the war effort is one which has been greatly appreciated by the management and employes of the company and has added substantially to the morale of the entire organization."

The company's traffic statistics were as follows: scheduled revenue miles 2,594,969 (2,553,209 in first six months of 1941), up 1.64%; salable seat miles 43,440,433 (43,880,450), down 1.01%; revenue passenger-miles 26,197,576 (19,391,527), up 35.10%; revenue passengers 81,709 (65,194), up 25.33%; mail pounds 1,386,958 (895,605), up 54.86%; mail pound miles (thousands) 485,832 (297,070), up 63.54%; express pounds 431,542 (199,679), up 116.12%; express pound-miles (thousands) 183,644 (87,440), up 110.2%.

Revenues and expenses (first six months of 1941 in parentheses): revenues: mail $667,494 ($512,927); passenger $1,220,654 ($886,961); express $52,684 ($27,696); other-net $37,343 ($16,503); total revenues $1,978,177 ($1,444,089); expenses: operating $896,599 ($867,749); maintenance and repair $353,331 ($382,503); traffic and advertising $159,987 ($136,583); general and administrative, $107,404 ($79,990); other-net $12,753 (552); depreciation $152,631 ($150,423); total expenses $1,682,708 ($1,617,802); net operating income $295,468 ($173,713 loss); net income before income taxes $341,259 ($138,817).

Hearing Set

Important hearing on applications of seven airlines for permission to furnish air transport service in the Caribbean area will be held Nov. 2, CAB has announced. The seven companies are National, Eastern, Expreso Aereo Inter-Americano, British West Indies Airways, TACA, KLM Royal Dutch Airlines and Aerovias Nacionales Puerto Rico.

Board's Reply Fails to Satisfy Sen. McCarran

CAB's reply to the Senate as to why it has not issued certificates to new carriers "is not satisfactory", Sen. McCarran (D., Nev.), author of the request, states.

CAB's reply in essence is that there is no established policy of not giving certificates to new carriers and that "it is only required that there be no uneconomical, mushroom-like growth and that there be no wasteful competition, factors which are inconsistent with the requisite showing of public convenience and necessity."

"The reply did not seek the facts; the reply avoided the facts", McCarran emphasizes. The facts remain, he says, as set forth in his letter of Feb. 24th to the chairman of CAB. In that letter McCarran made a listing of new carriers which had applied and been denied routes by the CAB, in favor of "grandfather" carriers. It showed the substantial increases in route mileage awarded to "grandfather" carriers.

"It was never the intention of Congress, in enacting the Civil Aeronautics Act, to freeze air carriers as they existed at the time of the act's passage," the Senator says. The record shows "without a single exception, where a new domestic carrier has been heard, the application of the new carrier has been denied, and further, that awards of routes wherefor a new carrier has applied have been granted only to 'grandfather' air mail contractors," he points out.

"I am sorry to say that the CAA has lost much since it lost its independent status," the Senator says. "It has bogged down so far as civil aeronautics proper is concerned. It is a great blessing that it was not taken by the Armv. and I hope it won't be taken over by the Army because civil aviation after the war is going to have a greater place in international development than any other one thing . . . This great possibility will be greatly impaired if civil aeronautics is taken out of independent status any more than it is at the present time."

CAB Accident Report

Fourteen fatal accidents were reported to the CAB'S safety bureau for the month of September, 1942. All of these accidents occurred in non-air carrier flying.

PCA Adds Stop

Pennsylvania-Central Airlines has resumed service to and from Clarksburg, W. Va.

Inwood to TWA: Louis R. Inwood, well-known assistant chief of WPB's aircraft priorities branch, joins TWA Nov. 1. He will work under E. Lee Talman, vice president-treasurer. At one time he was associated with Jack Frye and Paul Richter, TWA president and executive vice president, respectively, in the Aero Corporation of California, operators of Standard Airlines, a TWA predecessor. Later he was with the Aeronautical Chamber of Commerce, Interstate Commerce Commission, Air Safety Board, CAB safety bureau, OPM and WPB.

PCA Trains Airline Pilots at Roanoke

A new airline pilot training program has been started by Pennsylvania-Central Airlines Corp., at Woodrum Field, Roanoke, Va., company reports. "More than 40 new airline pilots can be trained at the . . . center each month," announcement states.

Candidates for the first group "have been selected from graduates of the Civilian Pilot Training Program." Major J. H. DuBuque, U.S.A., retired, will have charge of the First Officer Flight Training program. Advanced training will be supervised by Capt. James T. Rinker, chief pilot of PCA's eastern division. A total of 47 instructors will conduct training.

Students will first be trained in instrument flying, and then will proceed to "actual multi-engined flight training." PCA has purchased a "fleet of monoplanes" for use in training.

Mason Resigns

George Mason has resigned as publicity director of Pennsylvania-Central Airlines. J. J. O'Donovan, vice president, will handle publicity, advertising and public relations temporarily.

Improved Packaging, Loading of Air Cargo Recommended

The nation's air cargo shipments can be increased approximately 33%—without additional cost in material and manpower—by modernizing loading and packaging procedures, according to the Air Cargo Association.

ACA is a newly-organized group headed by Thomas Wolfe, vice president of Western Air Lines, and said to be composed of research men, engineers and traffic experts of major aircraft companies, WAL and Army personnel in Southern California.

Among aircraft companies said to be represented are Douglas, Lockheed, North American, Vega, Vultee and Consolidated.

The group has made an analysis of 50,000 air cargo shipments involving over 1,000,000 lbs., and preliminary findings indicate that about 18% in cargo space, 10% in cargo loading and 5% in size of cargo containers is now wasted because of outmoded practices.

Entirely too much "lumber" is being transported, according to the group's study, which adds that packaging should be more compact.

Wolfe said that the association was conducting the studies to increase the plane's efficiency in its "tremendous job of logistics now shouldered by the industry."

AIRLINE COMMENTARY

Among interested parties hoping for quick action by CAB on air mail rate decisions is the Post Office Dept. . . . The fact that the Board has not issued rate cases is playing havoc with the PO's records . . . The air mail division won't be able to tell whether it operated at a profit or a loss last fiscal year until it knows what rates are to be paid, and whether or not they will be retroactive . . . American Airlines, for instance, isn't receiving any mail pay now, because the PO doesn't know what to pay . . . It has a whole table stacked with AA accounts that it would like to settle . . . CAB officials hint broadly that action on rates will occur quickly . . . They also hint that the delay is not all their fault—probably meaning difficulty of obtaining War Dept. permission to release the decisions . . .

●

Airline officials visiting Washington will be confronted with a little more red tape before long . . . In a few weeks it will be necessary to go through the same procedure to get into the Commerce Dept. as you must now go through to see someone in the War and Navy Depts. . . . This means giving your name at the door, waiting while a receptionist calls the office where you're going, signing in, signing out, etc. . . . Details have not been ironed out but system will be essentially that used by Army and Navy . . .

●

A Court of Claims decision on the United Air Lines 1934 air mail cancelation suits gets closer and closer . . . Some looked for a verdict when the Court met on the first Monday in October, but it wasn't forthcoming . . . They now look forward to the first Monday in November . . .

●

Plans to take Col. Ray Ireland's priorities division out of the Air Transport Command and raise it to "staff" level seemed to have cooled off . . . Nothing may be done now . . .

●

Rumor has it that the Post Office Dept. will not issue a cost ascertainment report this year . . . This is the report that attempts to allocate PO costs to the different types of mail service, including air mail . . . As a result, air mail always shows a sizeable loss for the year . . . The airlines have always claimed that the report presented a distorted picture . . . Reason for not issuing it is said to be the manpower shortage caused by the war . . .

●

It will probably be some time before the CAB is permitted to release the forms 2780, containing monthly airline operating and financial statistics . . . These were placed on the secret list by the War Dept. some time ago because they contained information of a military nature . . . CAB is attempting to segregate the secret data and release the remainder, but its efforts haven't been too successful to date . . .

●

"I can remember the day," an airline station manager told us recently, "when we'd solicit a man for weeks to get him to ride our airline. We'd even carry his wife for nothing. I never thought I'd see the day when we'd be standing out there with a club trying to keep the passengers away. But that's the way it is now! . . .

●

At this writing the airlines are preparing to switch over to winter schedules, effective Nov. 1 . . .

E. B.

Actions of the Civil Aeronautics Board

Order No. 1950, Sept. 17, 1942: Suspended student pilot certificate No. 2[illegible] held by V. F. Crain, to be effective 60 days and after, until satisfactory completion of a written examination on Parts 01, 20 and 60 of the Civil Air Regulations.

Order No. 1951, Sept. 23, 1942: Suspended private pilot certificate No. 63[illegible] held by Joe R. Massey, Jr., for six months.

Order No. 1952, Sept. 23, 1942: Suspended private pilot certificate No. 15414-[illegible] held by Richard H. Harris, for six months.

Order No. 1954, Sept. 25, 1942: Suspended private pilot certificate No. 15[illegible] held by Donald Randolph, for six months.

Order No. 1956, Sept. 26, 1942: Suspended private pilot certificate No. 23715-[illegible] held by Philip H. Browne, for 60 days.

Order No. 1959, Sept. 30, 1942: Suspended private pilot certificate No. 12911-[illegible] held by Ralph D. Cohn, for 90 days.

Order No. 1960, Sept. 30, 1942: Revoked the flight instructor rating of [illegible] West, with the provision that application may be made at any time after Sept. 28, 1942, for an instructor rating. At the same time, suspended commercial pilot certificate No. 2830, held by West, for 90 days.

Order No. 1961, Sept. 30, 1942: Dismissed petition of Jacques M. Mouries, [illegible] citizen, for a waiver of citizenship requirements of Civil Air Regulations, and from the refusal of the Administrator of Civil Aeronautics to issue to him an identification card.

Order No. 1963, Oct. 2, 1942: Suspended student pilot certificate No. S-37[illegible] held by Adolphe Montell, for 30 days.

Order No. 1966, Oct. 5, 1942: Suspended private pilot certificate No. 53515, held by Harold Foster, for 60 days.

Order No. 1967, Oct. 6, 1942: Authorized Inland Air Lines, Inc., to suspend service as to property, persons and mail on route 35, from Oct. 6, 1942, until Oct. [illegible], 1942, inclusive.

Order No. 1968, Oct. 5, 1942: Approved cancelation of contract CAB No. [illegible], an agreement regarding issuance of airline passes.

Order No. 1969, Oct. 5, 1942: Approved agreement in contract CAB 178, resulting from a resolution of the Air Traffic Conference of America regarding issuance of airline passes.

Order No. 1970, Oct. 10, 1942: Revoked private pilot certficate No. 53862-41, of Ronald A. Smith, claiming Smith used notes during an examination for a commercial pilot certificate.

Order No. 1971, Oct. 10, 1942: Revoked student pilot certificate No. S-35[illegible] of Raymond N. Austin, for alleged unauthorized use of notes during a written examination for a commercial pilot certificate.

Order No. 1972, Oct. 12, 1942: Granted permission to Compania Mexicana de Aviacion, S. A., to intervene in the matter of temporary amendment of certificate of public convenience and necessity of American Airlines, Inc., and Braniff Airways, Inc., authorizing air transportation between San Antonio, Texas, and Laredo, Texas.

Order No. 1973, Oct. 13, 1942: Denied petition of Chicago and Southern Air Lines, Inc., to suspend further proceedings of applications of National Airlines, Inc., Delta Air Corp., Braniff Airways, Inc., Eastern Air Lines, Inc., and Chicago and Southern Air Lines, Inc., for certificates and amendments of public convenience and necessity.

Order No. 1974, Oct. 13, 1942: Amended temporary exemption order issued July 9, 1942 (Order Serial No. 1833), to authorize Northwest Airlines, Inc., to serve non-priority passengers originating in or destined to Helena, Mont., through Great Falls, Mont., while airport at Great Falls, Mont., is inadequately lighted for night operations.

Order No. 1975, Oct. 14, 1942: Directed consolidated hearings in the cases of Edmund Tobola, Homer R. Wall and Clarence M. Sharpe, charged with alleged violations of CAA regulations.

Order No. 1976, Oct. 14, 1942: Approved holding by John M. Hancock of directorships in both American Export Airlines, Inc., and American Export Lines, Inc., and any office or offices which Hancock may hold within the system of affiliated or subsidiary companies.

Order No. 1977, Oct. 14, 1942: Suspended private pilot certificate No. 106616, of Earl E. Shively, for six months, for piloting an aircraft at less than 500 feet over land and water, in the vicinity of Lake Tahoe, Nevada, contrary to CAA regulations.

Order No. 1978, Oct. 15, 1942: Rescinded Serial Order No. 594, affecting Pan American Airways, Inc., service between Port-au-Prince, Haiti, and Maracaibo, Venezuela, and also exempted Pan American from provisions of CAA Act of 1938, section 401(a), insofar as such provisions would prevent temporary air transportation between Miami, Fla., and La Guaira, Venezuela, via Camaguey, Cuba, Port-au-Prince, Haiti, and Ciudad Trujillo, Dominican Republic. This exemption will be in effect 30 days from date of issue, provided Pan American files an application amending application in Docket No. 456.

Order No. 1979, Oct. 15, 1942: Exempted Pan American Airways, Inc., from conditions of its certificate of public convenience and necessity issued Jan. 10, 1941 (Order Serial No. 1487), during the period from Oct. 17, 1942, to May 1, 1943.

Order No. 1980, Oct. 15, 1942: Exempted temporarily American Export Airlines, Inc., from provisions of section 401(a) of CAA regulations, insofar as such provisions would prevent this line from operating during the period from Nov. 1, 1942, to May 1, 1943, between the terminal point New York, N. Y., and Foynes, Irish Free State, westbound via the intermediate points Bathhurst, Gambia, and Port of Spain, Trinidad, and eastbound via the intermediate point Bermuda.

Order No. 1981, Oct. 15, 1942: Granted permission to Eastern Air Lines, Inc., to serve Macon, Ga., through the use of the Herbert Smart airport, on Oct. 15.

The long arm of the allied navies continues to reach out and spot the enemy with deadly accuracy. The Bismark...the Jap advance on Midway... the operations in the Aleutians...and other unheralded tip-offs are to the credit of Consolidated PBY Catalinas flown by U. S., British, Dutch and Australian airmen.

Flying aboard ships like these are products of this company which go to make up the great Invisible Crew. Radio accessories by Bendix Aviation, Ltd., are at the front on virtually all American aircraft.

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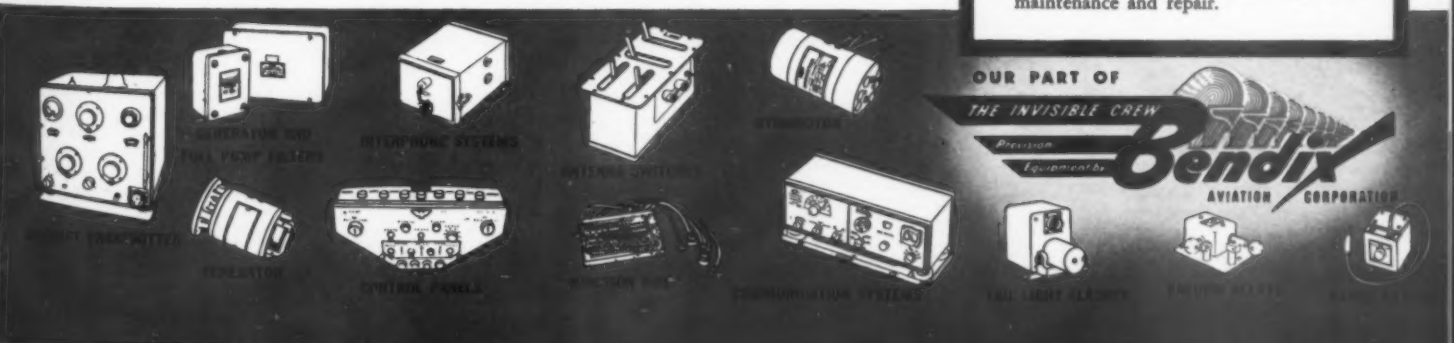

Airline Expansion to Accent Engineering

Research and Planning Will Assure Future Designs Being 'Transportation Vehicles', Writer States

By E. J. FOLEY

A RELATIVELY new phase of the engineering profession—air transport engineering—must come of age with the ever increasing accent on airline operation as a transportation medium. Like so many other professions, it is facing, and probably will face for some time to come, alternate blessings and blasphemy, depending on the speaker.

Today's organizational practices in air transport assign to engineering one of two roles in the company setup. Where maintenance is a function of the operations group, then engineering is in a "class by itself" and may be thought of as a technical, experimental service branch of the airline. It functions as a consulting development unit watching at all times, of course, the practical angle—even though an eye-corner glance may be all that can be spared.

The second current practice places maintenance under the jurisdiction of the engineering department and automatically determines that, by and large, the engineering function is "maintenance engineering," the personnel "maintenance" in thought and activity. On a line of action normal to the technical experimental engineering, it concentrates upon practical maintenance considerations, developing techniques for maintenance, maintaining performance records, assuring maintenance progress at home and abroad among the manufacturers.

E. J. Foley

One point is common, it seems, to both: that is the ability to engender as much private punishment as public praise. This is no indictment of the profession; merely an admission of an explainable shortcoming that must be remedied in the course of progress.

Where engineering is a departmental entity distinct from maintenance, the "practical" men may condemn it as a nuisance, whose apparent function is to stimulate confusion and delays, "to tie things up just so they can make some confounded meaningless test." Rather than to permit such feeling to blossom into morale—destroying resentment, special consideration by engineering of maintenance pressure, the taking of maintenance into "educational confidence" by the engineering group and similar activity should be established sales functions of engineering. True enough, this selling takes time and a direct order cuts corners; cutting corners is all right if you cut nothing else and taking time may be saving time from the long term point of view.

Where engineering and maintenance are allied departmentally and engineering exercises control, the primary gripe is against red tape, the engineering delays, the inattention to certain projects which are properly magnified in the eyes of shop personnel and may be erroneously considered inconsequential by the less directly affected engineers. These associated short-comings call for education too, but possibly more important, they accent the need for engineering staff adequacy and expeditious office practices to assure the "service" that is so active an engineering function in this type of organization.

Is either of these two solutions to the problem of the necessity for engineering in the air transport field the proper one from the standpoint of organization? We feel they are both fundamentally correct; present operations prove that they are both workable. However, they appear to us to be half solutions which added and boiled down might offer the ultimate in workability and overall engineering efficiency. While it may not be our place to indicate preference for either as a working basis for our compromise, we are of the opinion that engineering allied to maintenance offers the best possibilities for the full utilization of engineering knowledge as applied to air transportation. There are, of course, those who will differ on this score, being unable to agree to the expenditure of engineering salaries and talent for maintenance functions.

Starting from this preferred fundamental organizational detail, our engineering organization incorporating practical maintenance and development engineering, may take a lead from the manufacturing industries. In so doing, we meet those who contend that engineering responsibility is best allocated by types of aircraft, i.e., one engineer to be responsible for the DC-3 from the propellers and windshield wipers through the cabin equipment to the flashing tail light.

To us, it makes more sense, assuming centralized location of the department, to break down by component—powerplants, instrument and electrical, aircraft proper, equipment, weight control, etc., to provide the adequacy of capacity and flexibility of growth to be demanded of us in the future. All aircraft engines currently bear a marked resemblance in detail as well as principle, so let one man handle them whether it be in a DC-3 or Stinson; the electrical system performs the same function now, knowing whether it's in a Grumman or Lodestar, and so on.

Admittedly, expansion may mean assorted aircraft, engines, instruments, etc.; it is granted that this may necessitate an engineering sub-organization for each airplane proper (if for none of the other components). However, we retain our basic setup by simply farming out our organization at the bottom, retaining a key engineer as active head of each section to supervise all appropriate activity.

With regard to weight control, the manufacturer sees it as a detailed engineering problem are we justified in treating it as any less? We think not. Engineering effort expended in the investigation of lighter adequate substitutes for everything from carpets to cockpit knobs can be an appreciable economy factor, assuming of course that maintenance considerations are duly regarded. When your fleet is weighed is there an engineering record and analysis of the "unaccountable"? Can part of it be explained by system fluids, residual fuel and oil and the like? These and related problems become more complex by the day.

Should Handle Repair

Aircraft engineering should handle repair and alteration stress analysis where practical to avoid the delay and difficulty often associated with manufacturer liaison on such projects.

But how does this organization represent a compromise of practical and experimental? We have chosen the practical maintenance-engineering as a basis so we must complement each component section of it with an experimental development-engineering group. This group, responsible to the theoretical-practical section head should be free of all maintenance responsibilities; should handle all appropriate development projects and in so doing assure the full absorption of all worthwhile technical advances into the operation of the airline.

Two Groups

Reverting for a moment to the practical, the "service" side of our engineering picture, there are two groups or individuals that we feel can be keystones in making this side of our engineering useful. With fleet size, aircraft size, crew size and route length tremendously expanded, our necessary job of maintaining manufacturer-liaison regarding service troubles may increase proportionally. Sources and volume of information multiply until we find it to our advantage to provide a purely maintenance engineering section whose sole responsibility is the collection and analysis with appropriate engineering section heads, and proper dissemination and follow-up of these data.

Similarly, as schedules tighten and utilization of equipment is heightened, "on-the-spot" engineering service is essential if we are to avoid maintenance complaints. Engineering liaison group spotted right on the service floor, handling as a unit the bulk of this work, re-

(Turn to page 55)

Flight Recorder: The new electronic device above is the "Flight Recorder" capable of "jotting down" 144 readings of temperature and pressure every 3 to 4 minutes in aircraft flight testing. Looking on are Lieut. Wm. C. Clay, U. S. N. test officer, and G. E. Muschamp, under whose direction the Recorder was developed by Brown Instrument Co., Philadelphia, a subsidiary of Minneapolis-Honeywell Regulator Co.

Improved Ignition Cable Introduced

Virtual elimination of the deteriorating effect of corona on the rubber insulation in airplane ignition cables has been achieved by American Airlines through the use of an ignition cable with an inner braid of Fiberglas fabric. Use of the cable during the past eight months has cut ignition cable failures by approximately 50%.

The cable consists of a core of copper wires, insulated with rubber, then with the Fiberglas braid, and the whole is coated with a synthetic rubber jacket. The glass fiber braid possesses relatively high tensile strength, dielectric strength, insulation resistance and high temperature resistance.

The primary function of the braid is to increase the mechanical strength of the complete cable, keep it from stretching and keep the insulation sealed to the copper core. It also gives body to the cable and decreases the action of "necking" when sealing grommets are used. The cable is so designed as to make

AA Uses New Cable

the glass braid and entire cable moisture-proof. Reduction of air space between core and insulation to a minimum provides virtually no field for the damaging effects of corona.

American Airlines' entire Flagship Fleet of passenger and cargo DC-3s is now equipped with this inner braid ignition cable. The cable is a product of Packard Electric Division of General Motors Corp., Warren, Ohio. Fiberglas fabric for the inner braid is manufactured by Owens-Corning Fiberglas Corp., Toledo, Ohio.

Celanese Celluloid

Celanese Celluloid Co., 180 Madison Avenue, New York, N. Y., makes several pertinent announcements. They suggest that their shatterproof window material, Lumatane and Vimlite, may be of value to the aircraft industry in the light of wide use as protective partitions and windows. Lumarith E. C. (Ethyl Cellulose), a plastic molding material available in many formulae for injection, compression and extrusion molding, offers high impact strength at low temperatures and good electrical properties. The product, heretofore known as Lumarith Protectoid, is now designated as Lumarith Transparent Packaging and Insulating Material.

Indirect Mercury Lighting Designed

Localized lighting, direct and indirect glare and shadows are said to be eliminated for the first time in industrial plants by a new method of indirect mercury lighting designed by a Westinghouse Lighting Division engineer.

Impractical for industrial use until the recent development of the 3,000-watt mercury vapor lamp, the system has been worked out, using a model of an airplane factory. This plant will be the nation's first installation of the high intensity indirect illumination.

By obtaining reflection factors for the white ceiling and floor of 75% and 65% respectively, about 35 foot candles of illumination is obtainable for under-wing work. It is maintained that no localized light will be required with this system.

Assembly Line Units Facilitate Handling of Radial Engines

A trio of new matched assembly line units has just been announced by the Aviation Division, Whiting Corp., Harvey, Ill. The ETN group, as they are called, is designed to facilitate the handling and moving of any radial aircraft engine from the time it leaves the packing case through final nacelle buildup.

The three matched pieces of equipment are as follows:

Model E, engine cleaning stand, which supports the engine for initial operations: washdown, preliminary accessory installation, etc. Two-way rotating arrangement permits holding engine in any desired position.

Model T, engine transfer carriage, which fits into Models E or N to simplify shifting engines from one unit to the other without overhead handling. This is accomplished by means of hydraulic lift in the unit. T may also be used for further accessory installation.

Model N, rotatable nacelle buildup unit, which provides a rotatable support for the efficient final assembly of accessories, cowling, plumbing, wiring and other parts. Tubular construction provides maximum accessibility.

All of these units are available in varying capacities for all sizes of radial engines.

Lectrohm Solder Pots

Solder pots of 1¾ and 2 pound capacity are being manufactured by Lectrohm, Inc., 5125 W. 25th Street, Cicero, Ill. Construction details follow: a cast iron pot, single screw mounted to a plated steel stand; a single porcelain nickel chrome heating element which may be quickly replaced as necessary; 110 v. AC or DC operation; six foot Underwriter's cord. Model 200 is the 1¾ pound size; Model 250, the 2 pound size.

FASTENINGS YOU CAN TRUST

1. Application is fast and fool-proof . . .

Their locking action is immediate and automatic . . . no pins, no washers, nothing to forget.

2. Grip is positive, yet resilient . . .

Threads of nut and bolt are held in contact under constant cushioned pressure. The nuts stay put.

3. The locking element does not fail . . .

Made of non-metallic, non-fatiguing material, it cannot be broken down by vibration or prolonged hard service.

There are more Elastic Stop Nuts on America's airplanes, tanks, guns, Naval vessels, and production equipment, than all other lock nuts combined.

» *Write for folder explaining the Elastic Stop self-locking principle*

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Elastic Stop SELF-LOCKING NUTS AND AIRCRAFT FITTINGS

WITH THE RED LOCKING COLLAR . . . SYMBOL OF SECURITY

Industry Asks to Keep Technicians; Engineer Turnover 48% in 1941

IMPATIENCE about the manpower question is brimming over among aircraft executives. You can hire all of the women and old men in the country, they point out, and still not build an airplane unless there is assurance of keeping the various technicians who furnish the brainpower.

Somewhere along the line in the allocation of America's manpower to the current war of production, they feel, the political and ethical arguments against blanket exemption of certain vital groups are going to have to give way to the force of logic. Otherwise America will certainly come to England's bitter necessity of having to call back from the armed services the men needed to build its airplanes.

America's industrial system, especially the aircraft industry, is expected to supply the mechanical sinews of war to the democratic world, and do it more and more with novice trainees impaired either as to gender, physique, mentality, morals or fear of imminent drafting.

The turnover among the young single and married men in the aircraft engineering departments of America is as high or higher than in wholly unskilled categories. This is because these well educated, intelligent groups with aeronautical experience gained either in college or factory are selecting their own service branches by enlistment rather than to await the drafting which they know is imminent.

Eight U. S. aircraft companies selected at random at present employ 9,000 engineers. In their engineering departments they suffered a 48% turnover during 1941, largely due to enlistments or selective induction. Consequently, when a recent survey showed that these companies anticipate hiring 6,550 more engineers up to the end of 1943, the figure had to include at least a 48% allowance for loss to the armed services. In other words, they have to figure on finding, hiring and expensively training just twice as many more engineers as their actual expansion program calls for.

Now they are studying new plans for more engineering training schools. Many women and older men are being employed, although few older people have the university education necessary. Nearly twenty percent of all future hiring must have university degrees. While the engineering departments of all of the aircraft plants are hiring and training twice as many such people, other industries will presumably be making the same expensive duplication of effort.

Industry sources believe there is only one answer to such waste. Present engineering staffs must be exempted as a group from drafting, and similar exemption must be extended to the limited number of new trainees of proper background which are needed to carry out the production program.

Unless these things are done, they believe, engineering training must continue to be given largely to men who may yet, according to Selective Service regulations, be called into the services. Not inside of five or six years could college and technical background be provided to permit more than a moderate percentage of aircraft engineering personnel to be women. Since there must be a certain fairly large percentage of younger men in such work, they ask, why continue training new batches and discarding the old?

There is some bleak comfort for war industry centers in the reflection that among the non-essential occupations there is still an untapped reservoir of known skills and experience, among men not subject to imminent drafting. These are the 3A men who last spring returned occupational questionnaires to their Selective Service boards. These skills and experience records have now been reduced to card files in the War Manpower Commission.

Until this reservoir is tapped, however, America's complicated war industry will hire more and more women and train them to work for which they are probably far less adaptable than the jobs now filled by men in non-essential industries. The same applies to the physically impaired and elderly people now being hired in war industry, all of whom are better adapted to service station, store clerking, selling and distributing, and other less vigorous occupations.

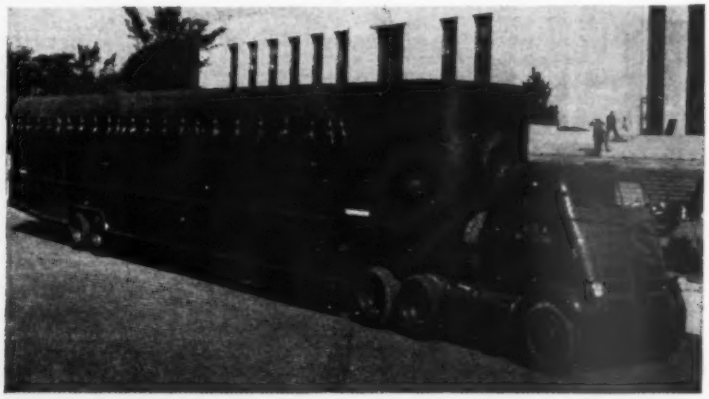
The only test of a job applicant, it has been said, is "whether the body is still warm". When Henry Kaiser recently hired 4,000 men in New York City, he rejected only about 2% of applicants. Although it has been reported that New York and Los Angeles are the only remaining large labor sources, the U. S. Employment Service in many cities says that each day's quota is definitely a fresh bunch.

Having lost 15,000 trained employes to the armed services since Jan. 1, the aircraft factories mentioned are training mechanics and maintenance men for the Air Corps at a rate of about 5,000 monthly, in addition to training women and old men to replace their own losses and meet their gigantic expansion schedules. Meanwhile every employe under 40 has a jittery feeling of impermanence not conducive to best morale. The employers faced with the biggest production job in history feel they are on a treadmill which had better soon be greased with some logical manpower allocation.

Spread Around

Officials of Consolidated Aircraft Corp., San Diego, Cal., say that the 315,000 parts of the B-24 Liberator flow in from suppliers and subcontractors in 28 states and the Province of Ontario, Canada. As many as 1,400 manufacturers make parts for this plane in almost 1,500 factories.

Huge Trucks to Haul Bomber Parts from Detroit to Texas



A fleet of 90 truck-trailers, any two of which will be equivalent to seven freight cars, is being constructed to deliver airframe subassemblies and parts from Detroit to a Texas assembly plant.

The fleet is to be divided into five groups of 18 trucks each. Operating plans call for four of the five groups to be on the road constantly, while the fifth is either loading or unloading. By continuous driving, the 1,300-mile trip can be made in two days, it is claimed.

According to the Automotive Council for War Production, the truck-trailers, the largest ever built for interstate service, are 73 ft. 7 in. long and are equipped with five axles and 18 wheels. When fully loaded, weight ranges from 50,000 to 63,000 lbs. Despite the fact that this is well over the maximum length and weight restrictions of many of the states covered on the journey, all have waived border barriers, it is said.

Power is supplied by two high-speed automobile engines under the cab. Each engine is mounted on a slide arm which allows it to be pulled out in front, clear of all obstructions. If an overhaul is needed, a new engine can be installed in 15 minutes.

Two of the units are equivalent to seven freight cars, and special design allows them to be loaded in 150 man-hours less than is possible when shipping by rail, says ACWP.

The trucks are manufactured by Mechanical Handling System Inc., Detroit, and they are operated by E&L Transport Co., Dearborn, Mich.

Industry's 1942 Dollar Output Near 4 Billion

Described by the Aeronautical Chamber of Commerce as the "greatest industrial expansion in world history," the U. S. aircraft industry at mid-October was already on the "threshold" of fulfilling President Roosevelt's 1942 goal of a production rate of 60,000 planes.

At Oct. 15 the monthly output was "pressing toward the 5,000 mark," with a huge increase in the number of heavy, long range planes, the Chamber said.

The industry this year will produce more than four billion dollars worth of planes, engines and propellers.

"Between Dec. 7, 1941, and Oct. 1, 1942, the industry . . . turned out a greater number of warplanes than it did during the entire 16-year period preceding the Japanese attack on Pearl Harbor.

"As late as 1938 the average monthly production of military planes totaled 150. By 1940 this number had been swelled to 500 a month, and during 1941 . . . nearly 1,500 combat planes were being produced every 30 days.

"The three years of World War II have witnessed a huge expansion of manpower and plant space. Today several of the companies each have more workers and more floor space than was utilized by the entire industry of 1939."

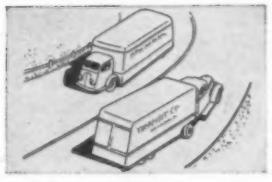
CLEVELAND PNEUMATIC PRODUCTS

serve from the mines to the flying fields!

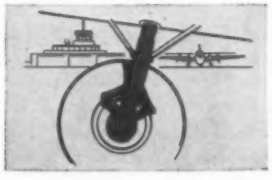
In the production of Cleveland Pneumatic Aerols*, which keep 'em landing safely and smoothly, all of the other Cleveland Pneumatic products play an important part.

MINING. The first step occurs underground where Cleveland rock drills help extract the iron ore as well as the other minerals used in Aerols.

METAL WORKING. Later, Cleco pneumatic tools, such as chippers and grinders, aid in finishing the metal forgings from which Aerols are made.



TRANSPORTATION. Cle-Air shock eliminators help speed deliveries on many trucks transporting the raw materials and the parts for Aerols.

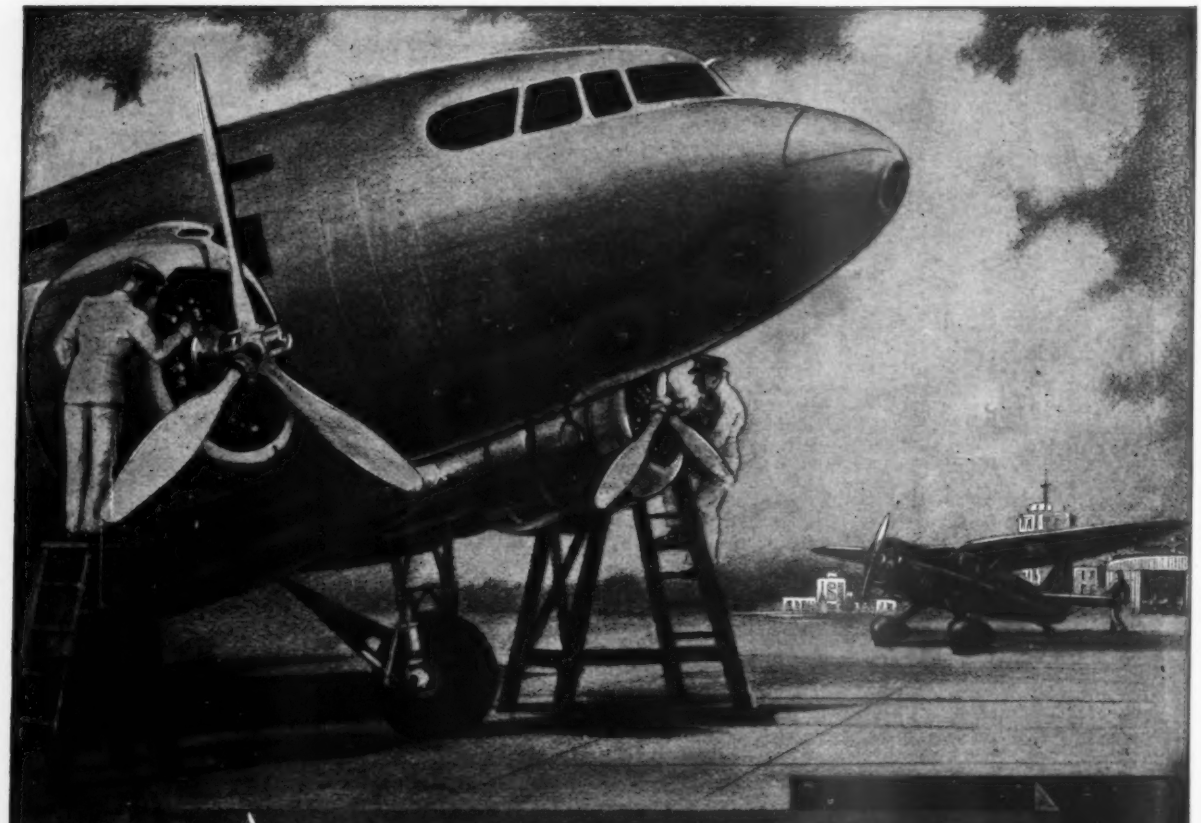


MANUFACTURING. Finally, at our own huge plant we manufacture the world-famous Aerols which are supplied for all types of airplanes.

Thus, from the mining of the metals to the time when the plane lands on Aerols, Cleveland Pneumatic products contribute to aviation's progress. The Cleveland Pneumatic Tool Co., Cleveland, Ohio.

AEROLS

*THE SHOCK ABSORBING UNITS ON AN AIRPLANE'S LANDING GEAR; THE NAME IS DERIVED FROM THE WORDS "AIR" AND "OIL"—THE FLUIDS USED TO DISSIPATE THE LANDING SHOCKS



The Fault Finders at Work...

ON the indicator in the Airport entrance-hall, the midday Southbound is scheduled to depart at 11-55 ack emma. It is now just 10-15, yet the great fifteen-place ship has already been out of its hangar for close on an hour.

When the time finally comes chocks are withdrawn and the twin engines roar into exultant crescendo for the take-off, a small gang of men in oil-smeared overalls will be watching with approving, confident eyes from the shadow of the control - tower. Those men are the 'fault-finders,' and their job is a vital one. Check, test and counter-check. Everything must be just **right.** The safety and efficiency of the ship is only gained by long hours of unremitting toil.

In the VOKES laboratories this same unremitting toil has been directed to the problem of filtration, and today the Vokes technologists have just cause for satisfaction. The result of their research has been the introduction of **an entirely different principle** of filtration which gives the amazing percentage of 99.9% efficiency. This is as near perfection as it is possible for human endeavour to reach. These filters (available for air and for high and low-pressure oil systems) filter down to particles 0.00004 in. diameter.

The value of such absolute filtration cannot be over-estimated. Here at last is pure air and pure oil —bringing inevitably with them greater working efficiency, less wear and tear, fewer renewals, less trouble. We shall be pleased to answer all enquiries through our agents.

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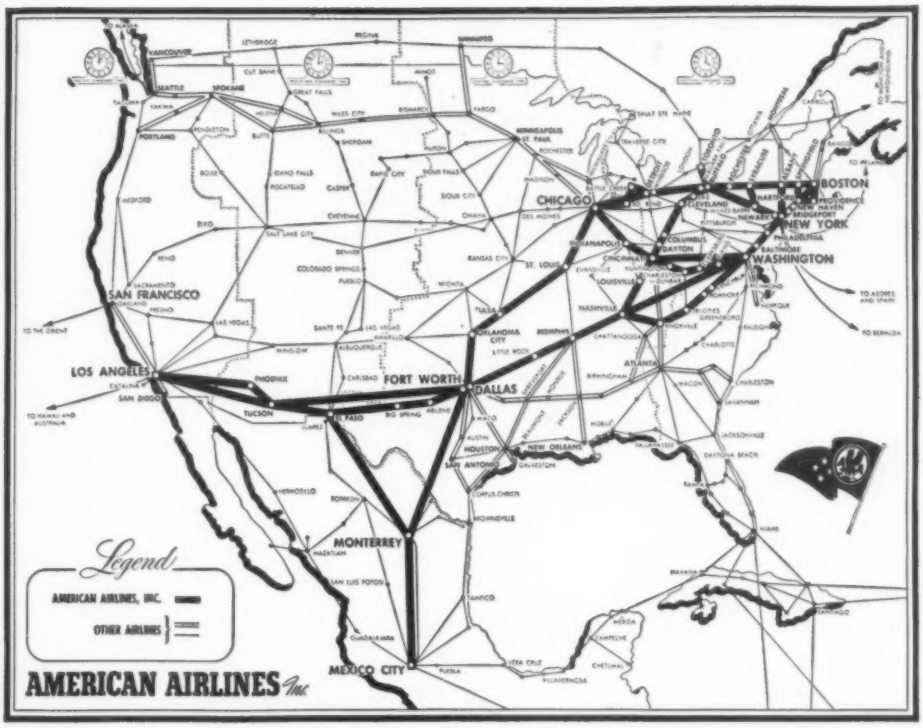

Flagship service connects the United States, Canada and Mexico

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Stewardess on all flights

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The American Airlines standard of service all the way

EVEN before the war, the necessity for this new aerial highway was dictated by the needs of a rapidly uniting hemisphere. The urgencies of a war now upon us daily commend the foresight which brought it to life.

By this international route you can go to Monterrey and Mexico City *all the way by air* from Toronto or Boston, from New York or Washington, from Chicago or St. Louis, from Los Angeles or Dallas—from any city served by American Airlines — or by connections from any other air line city.

When planning a trip "South of the border," make it a point to get full information about this time-saving international service.

AMERICAN AIRLINES *Inc.*

ROUTE OF THE FLAGSHIPS

PIPER CUB

ALL-OUT FOR VICTORY

Piper planes, Piper employees, Piper distributors and dealers are 100% in this great fight for democracy!

The famous Piper Cub Trainer, America's most popular civilian training plane, is now giving thousands of American airmen their initial flight training. The Piper Cruiser is also training pilots and is serving the Civil Air Patrol in numerous wartime capacities.

And new members of the Piper Cub family . . . the L-4B Army Grasshopper, the TG-8 Training Glider, the Piper Navy Ambulance . . . are doing notable jobs in their special fields.

At the Piper plant a great army of production is going "full steam ahead" producing planes, gliders and Signal Corps equipment for Uncle Sam. Hundreds and hundreds of former Piper men are now serving with the armed forces. Piper distributors and dealers are training pilots in the CPT and Army Contract Schools.

Yes, Piper Cub is all-out for victory, pointing the way to wings for Uncle Sam's airmen. And when the war is won Piper will point the way to wings for peacetime America!

PIPER AIRCRAFT CORPORATION

LOCK HAVEN, PENNA.

ONE-THIRD OF ALL THE REGISTERED PLANES IN THE U.S. ARE PIPERS

THEY'VE GOT THE RANGE

Essentially, bombers are artillery of tremendous range (ask Tokyo) and exceptional accuracy.

Contributing to this range are Delco aircraft fuel pump motors for transfer duty, assigned to safeguard the flow of fuel from multiple tanks on American bombers. Lightweight, compact and dependable, these motors conform to latest military aircraft requirements.

Similar Delco fuel pump motors, driving booster pumps, are factors in the speed, climbing ability and maneuverability of our fighter planes. Delco Products has applied its long experience in precision manufacturing to this assignment, and to the building of other aircraft equipment and naval and ordnance materials for America.

DELCO MOTORS

DIVISION OF GENERAL MOTORS CORPORATION

DELCO PRODUCTS
DAYTON, OHIO

Rearwin Aircraft Purchased by New York Group

New York interests headed by Charles (Carl) H. Dolan have purchased Rearwin Aircraft & Engines Inc., of Kansas City, Kan. Dolan was elected president and general manager on Oct. 8.

R. A. Rearwin, former president, said he and his sons, Kenneth and Royce, would continue as employes under the new set-up.

Dolan, well known as a pilot, aeronautical engineer and recently as a munitions manufacturer, is an air pioneer of 30 years experience. A member of the Lafayette Escadrille, he has been prominent in aviation since.

During his career he has been advisor and inspector of the Chinese Air Corps; surveyed Inter-Island Airway in Hawaii; survey of Pitcairn Aviation; chief engineer, vice president and operations manager of Eastern Air Transport; aeronautical valuation engineer for U. S. Post Office air mail service; technical advisor, Senate air safety committee; president and chief engineer, Intercontinent Aircraft Export Corp.; president and general manager, Wissachicton Tool Works; general manager, Chicago Pneumatic Tool Co.

Hughes Praises Lockheed Engineers on Constellation

Howard Hughes, president of Hughes Aircraft Company, Los Angeles, has issued a statement praising Lockheed Aircraft Corp. engineers on the eve of flight tests of the Constellation transport plane which Hughes and Jack Frye, president of TWA, designed. The Constellation is being built by Lockheed.

The Hughes statement follows:

"About four years ago I participated in a flight which, naturally enough, is completely forgotten today. However, a statement I made in connection with it seems worth repeating.

"At that time, I said that if any credit might be due for the flight it should go entirely to the several hundred engineers who spent many thousands of hours on the design and engineering of the remarkable plane which made the project possible.

"Now, four years later, a great new airplane is about to be completed, the largest, finest, and fastest passenger-carrying airplane in the world.

"The building of this plane was started long before the war. It was intended as a peacetime airliner. However, it is a military weapon of some value since it can carry more men than our present airliners, and at speeds and altitudes hitherto unapproached by this type of plane.

"I have received some credit in connection with the conception of this airplane.

"In this case, as before, I would like to say that the real credit should go to the two or three hundred engineers who have spent even more thousands of hours on the design and engineering of this plane.

"The airplane I am speaking about is the Constellation. The engineers I refer to are the members of the Lockheed engineering department and particularly Hall Hibbard, vice president and chief engineer, and Clarence L. Johnson, chief research engineer.

"If the plane is a success, and I am sure it will be, these men deserve more praise than anyone else.

"Incidentally, the plane in which I made the flight around the world was a Lockheed 14 and the engineers I was referring to four years ago were the same—Hall Hibbard, Clarence L. Johnson, and all of the members of the Lockheed engineering department.

In fact, curiously enough, almost everything I have done has been linked in one way or another to the Lockheed company and I want to thank Robert E. Gross, the president; Cyril Chappellet, vice president, and Carl Squier, vice president in charge of sales, for the help, advice, and assistance they have given me on so many occasions".

Timm Expands to Fill Army Contract

Receipt of an Army contract has made necessary further "expansion of operations" of Timm Aircraft Corp., Van Nuys, Cal., according to Otto W. Timm, president.

Details of the contract were not disclosed, but it is understood "many of the component parts have been subcontracted to local firms capable of fabricating aircraft parts from plastic-bonded-plywood."

Company officials announce confirmation of a contract with the U. S. Navy, for production of Navy Trainer N2T-1, was recently received. Timm is reported already in production on the plane, called the Timm Aeromold Trainer. It is "believed to be the first all-plastic-bonded-plywood airplane ever purchased by the Navy."

Clamps . . . Washers . . .

STAMPINGS for AIRCRAFT

With 21 years of experience producing pressed metal parts for the automotive industry, extensive facilities and trained personnel make possible prompt service, accurate workmanship, and quality that meets aircraft equipment standards.

Your needs for tube clamps, washers, and other pressed metal parts will receive immediate and intelligent handling.

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ESTABLISHED 1920

Army Develops Camouflage for U. S. War Plants

Successful camouflage for U. S. war plants and all Army shore installations has been developed by the Corps of Engineers, U. S. Army, which now has men throughout the service commands to consult with war contractors and assist them in disguising their plants.

The Engineers' Washington headquarters will advise any manufacturer where the nearest expert is located.

For completely successful camouflage it is advisable to choose the plant or installation site before building starts, the Engineers explain. The structure should not be erected near any distinguishing landmarks such as rivers, peninsulas, railroads, bodies of water or other identifying marks that the enemy presumably knows. The site should be picked largely for the natural advantage of trees and broken terrain. Dispersion of buildings is important.

Adds Only 10 per cent

The Engineers say it should add no more than 10% to the construction contract to stipulate that the natural cover not be destroyed. In this manner materials are placed in certain restricted spots only—paths that mark a guide to a new plant and remain as scars are not created.

However, it is frequently impossible to call in the Army technicians at the beginning, as too many U. S. plants were producing war materials before Pearl Harbor, and must continue at maximum output.

For these plants a number of methods have been devised: the all-out camouflage from the oblique, and the tone-down.

3 Methods

All-out camouflage can be done by planting, by painting, and by the use of nets. Planting is considered the best system because it is far more confusing from the air and because it is more permanent. For this reason many of the technicians in the camouflage section are former landscape architects. Painting may be done on both the building and the ground, but must be renewed often. Colors must be glaring to retain a semblance of shape 20,000 feet in the air when every color is turned to gray. Camouflage is planned for that altitude, at which most reconnaissance and photographic planes are flown. Nets and garnished wire are useful in breaking up the outline of buildings.

Oblique means camouflage from an angle. Quite frequently this is sufficient for establishments well equipped with anti-aircraft because a bombardier must sight his objective five miles or so away in order to drop his bomb load accurately. Otherwise the plane must circle and return. For this reason it is not always important to use camouflage from a direct overhead view if the object is disguised from an approach angle, according to the Engineers. Oblique is achieved by the same methods as all-out, but it is not as complete.

The tone-down is usually a treatment with paint to reduce conspicuousness of objects. It is a general treatment to erase glaring characteristics of the installation.

The principal thing seen from the air is shadow, and that is the most difficult obstacle to surmount. Shadow must be disguised and treated to break up shadow forms. Painting with the object of breaking up design must be continued from the building onto the ground nearby. Even painting is not always successful because there is no paint in existence as black as shadow.

Planting is more effective because it can be arranged to blend into the surrounding countryside so that the shadow of a building is obstructed. If the establishment is in a rural setting large trees and thick undergrowth can be used, but if it is in a suburban setting it may be broken up into units representing adjoining residential buildings to keep from being conspicuous.

The Engineers have devised other formulas that are not given out to the public, and they use many of these treatments to camouflage war contract plants at the request of the owners.

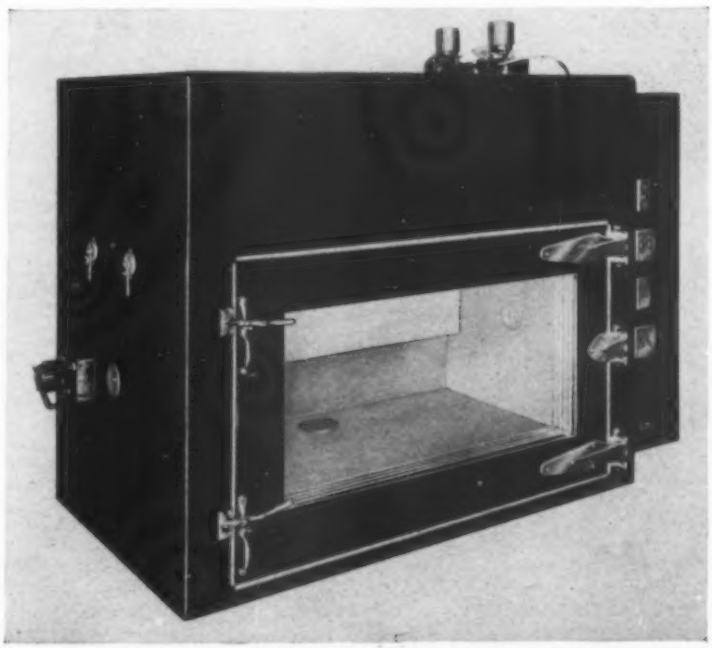
Permit Required for Canadian Aircraft Manufacture

Manufacture or assembly, and even repair, of aircraft in Canada, are now limited to fulfilment of orders placed by the Federal Government, according to an order issued recently by Aircraft Controller Ralph P. Bell, the Dept. of Munitions and Supply announces from Ottawa.

No manufacturer or contractor can proceed with either of these operations without written instructions from Bell. Even on a repair or overhaul job, no contractor may use, except by special permit, any government facilities for operations not covered by his contract.

CAP to the Rescue

The part that the Civil Air Patrol is playing in war production was recently illustrated when a CAP plane from the York, Pa. courier station "rescued" a truck load of castings stalled in Virginia. The plane flew the 700 lb. load from Virginia to York, thus saving two full work days.



Instrument Test Chamber: This new high and low temperature chamber for testing precision instruments is known as Model RTC-1 and is the product of American Coils, Inc., Newark, N. J. Mechanical refrigeration and electrical heating give the unit a range of operation temperatures from —55°C. to +70°C.

The unit consists of a two-stage condensing unit, heat exchanger, liquid sub cooler, coil or evaporator, expansion valves, forced draft strip heater, controls, and the cabinet. The all-steel cabinet provided with six inches of Fiberglas insulation measures 83" wide by 56½" high by 42" deep; the usable interior is 28.7 cubic feet, or 59" by 28" high by 30" deep. Observation of instruments is made through an inner door with five glasses sealed and dehydrated against future moisture passage. The visible opening is 46" wide and 21½" high; door opening is 51½" by 26".

MPG Digest

TIMM AIRCRAFT Corp., Van Nuys, Cal., announces the company's general offices are now located in the William M. Garland Building, at Ninth and Spring Streets. Principal executives are at the new address, along with the accounting and purchasing departments.

FLEETWINGS, Inc., Bristol, Pa., has appointed five women engineers, its first, and company claims it is the first of all aircraft companies to so employ women. These women start as junior engineers, and have been assigned to aerodynamics, structures and service engineering.

CESSNA AIRCRAFT Co., Wichita, Kan., has received the first Army-Navy Production award to be bestowed upon any Midwest aircraft manufacturer. Company claims it has consistently exceeded its production schedule for more than two years. Cessna also reports it is now making the C-78 Personnel Transport plane, a twin-engined, low-wing cabin monoplane, with a capacity of five persons. Due to "rapid acceleration of production schedules," Cessna has moved many offices and departments to downtown warehouse and office buildings. Analysis of personnel applications shows that the firm's workers are now recruited from a wide variety of vocations, ranging "from barbers to broom makers."

UNITED AIRCRAFT Corp., Pratt and Whitney division, East Hartford, Conn., reports it received on Oct. 14 the first white star to be awarded in the aircraft industry, for "a second six months of outstanding production." The star was affixed to the Army-Navy "E" burgee.

UNITED AIRCRAFT Corp., East Hartford, Conn., announces its Missouri subsidiary will in future be known as the Pratt and Whitney Aircraft Corp. of Missouri. It was formerly United Aircraft Corp. of Missouri.

MINNEAPOLIS - HONEYWELL REGULATOR Co., Minneapolis, Minn., has opened a new plant in Illinois for production of electronic devices for military aviation.

NASH-KELVINATOR Corp. has issued a summary of its war activities, explaining that most of its work is now in aviation. It claims it is the only company building all three of the major products of United Aircraft Corp. They are: Vought-Sikorsky flying boats, Hamilton Standard hydromatic propellers and Pratt and Whitney airplane engines.

WILLYS-OVERLAND MOTORS, Inc., aircraft division, will graduate more than 500 aircraft workers monthly from its new school in Ohio, according to recent report.

AIRCRAFT PARTS DEVELOPMENT Corp., Summit, N. J., announces it is in operation, and ready to "handle research and development work on parts and materials for the aircraft industry, especially in the fields of fastening devices, powdered metals and plastics."

Wright Conducts Cold-Weather Engine Tests

Air fleets of the United Nations will get suggestions for out-of-door engine starting in sub-zero weather this winter from tests being conducted by engineers at Wright Aeronautical Corp.

Since early last spring, Wright's engineers, in collaboration with research workers of the Standard Oil Co., have experimented with a 1700-hp Wright Cyclone in a test cell duplicating as closely as possible the sub-zero weather conditions of Arctic regions.

Beginning at zero on the Fahrenheit scale and then chilling the test cell five degrees lower with each successive test, Wright engineers are using the engine "to test new fuels, lubricants, batteries, magtos, spark plugs and other equipment designed especially for cold weather."

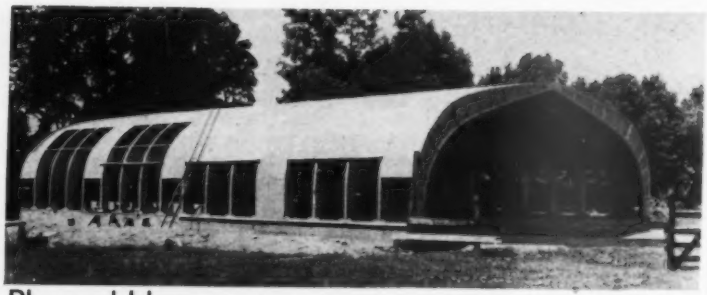
Once the motor has started, according to Wright, "extreme cold . . . is only incidental." Because of this fact, all efforts in the tests are concentrated on starting. Engineers observed that at 50 to 60 degrees below zero, such temperatures "can congeal lubricating oil to the consistency of glue, change gasoline into a lifeless fluid, and rob batteries and magnetos of voltage."

Factors

In conducting the tests, five major factors of winter operations are used in measuring performance characteristics. First, "the engine must turn over. Pistons, gears, crankshafts and all moving parts must be freed from the vise-like grip of congealed oil." Use of low-viscosity oils and pre-heating in a tent or hangar help to overcome this obstacle. Second, is to turn over the starter. Special winter lubricants and a high-output battery get at this difficulty Third, "is to get fuel to the engine." Special gasoline that will vaporize at as low as 50 below solves this problem. Fourth, "A hot spark must be provided." And this one "calls for magnetos designed for cold weather output, equipped with cold weather lubricants." Also, spark plugs must be efficient at these temperatures. And finally, "The engine has to be designed so that clearances at 50 degrees below zero do not cause interference."

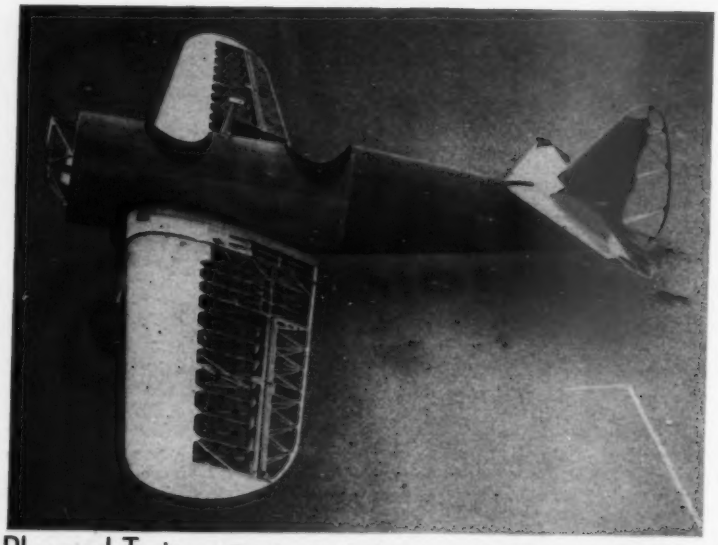
As they bring temperatures down during these tests, engineers try various combinations of equipment. In this way they find the lowest point of efficiency for fuels, primers and electrical units. From these observations, at each stage and with each combination of equipment, recommendations are passed along to United Nations operators.

Results of these experiments are expected to be made available to motorists eventually, but at present will be applied only to warplanes.



Plywood Hangar: Marine Air Research Corp., Annapolis, Md., proposes the construction of hangars made almost entirely of plywood and laminated wood strips bonded together with Plaskon resin glue. The one pictured above is 68 feet long with a clear span of 40 feet and a height of 14 feet at the peak. MAR claims it could be produced quickly and at low cost. A load test on one of the arches was said to have caused no failure until over ten tons had been added.

'Assembly Line': A different—but very necessary—assembly line is now being operated at Consolidated Aircraft Corp. In addition to hot meals, more than 75,000 individual articles are sold to employes during the three half-hour lunch periods. Picture shows Mrs. Iva Hobby and Mrs. Lelah Moore, left to right, placing sandwich filler on the line of bread.



Plywood Trainer: Construction features of Ryan Aeronautical Corp.'s new PT-25 plastic-bonded plywood military trainer are revealed in considerable detail in this photo, showing the basic structure before covering the airframe and installing the power plant.

Die-Hards?

The following letter was received by the editors of *The Aeroplane*, British aeronautical publication:

"For some time past I have been led to believe that the airscrew pulled an aeroplane whilst the propeller pushed.

Recently an RAF friend stated the fact that the term airscrew had been abandoned because of the confusion caused between it and air crew. He says that propeller is now the official term. Is this correct?"

To which *The Aeroplane* answered:

"The authorities have, in their wisdom, decreed that 'propeller' should be used when airscrew is meant. The term 'air crew' is of much more recent vintage than 'airscrew.' We object strongly to the new and illiterate official nomenclature and shall continue to use airscrew for airscrew (tractor) and propeller for the pusher variety, which is correct. 'Flight crew' is an excellent alternative to the other words."

Renegotiation Law to Get Further Trial

The method for controlling war profits will be a dead issue on Capitol Hill—for some time at least. Congress has decided to give the renegotiation law a further trial, at least.

The decision meets with the hearty approval of government purchasing departments which remain unalterably opposed to a flat percentage profit limitation law.

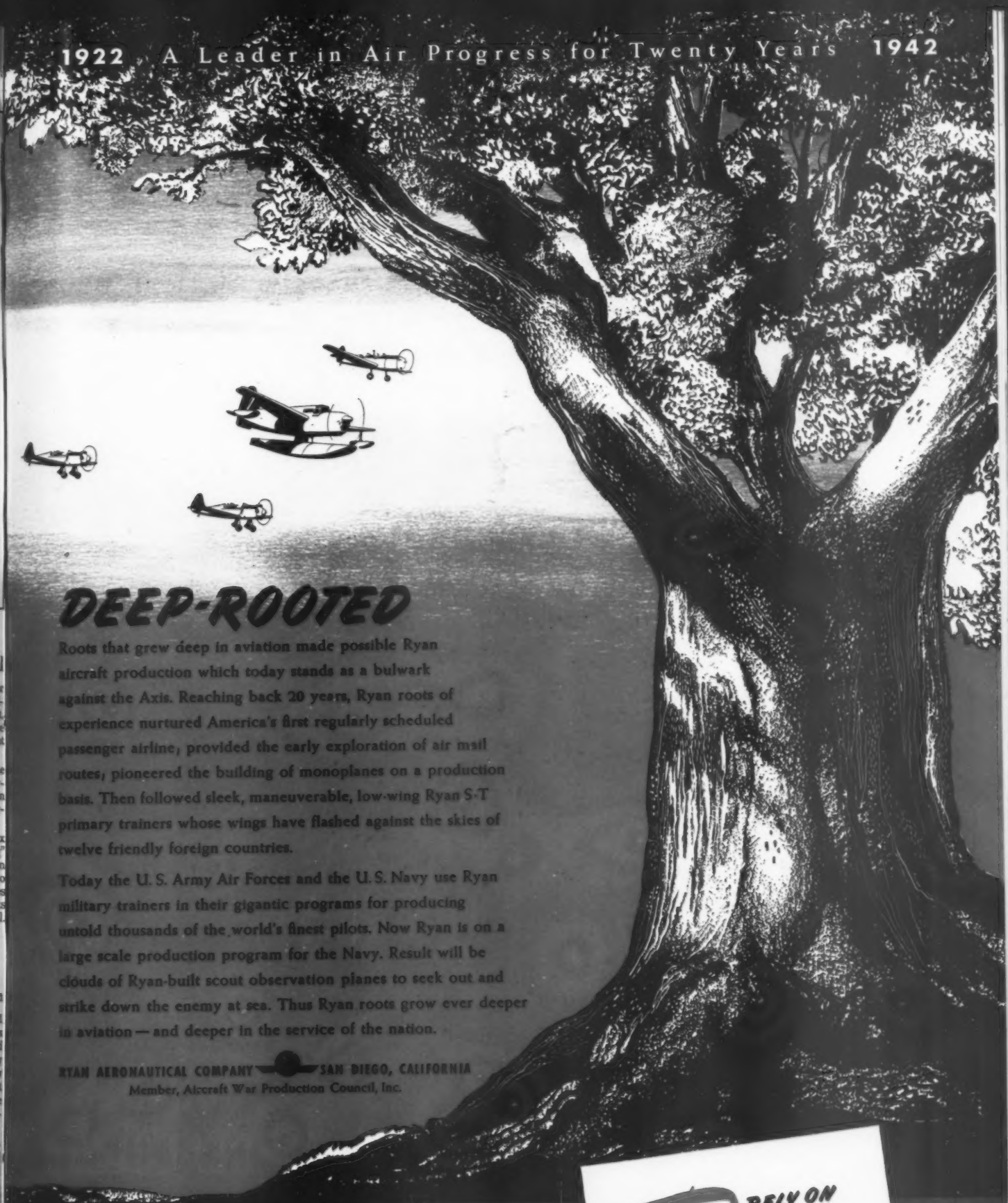
The Walsh amendment to the tax bill makes innumerable "improving" amendments to the renegotiation law—authorizing the departments to force contract renegotiation in cases of excessive profits—and sidetracks any other profit limitation proposal.

Logan Hand Screw Machine in Production

The Logan Engineering Co., 4001 Lawrence Ave., Chicago, announces the production of its No. 830 Hand Screw Machine which has a capacity of ⅝" round bar stock. This new lathe was developed to meet current needs for a small fine tool capable of accurate and continuous production.

Features of design and construction include: precision-ground bed with two prismatic "V" ways and two flat ways; pre-loaded ball-bearing spindle mounting; turret holes bored from headstock; turret and cross-slide provided with adjustable gibs to compensate for wear. A new speed collet chuck for handling round work which may be fed through the spindle and a bar feed attachment are offered as accessories.

1922 A Leader in Air Progress for Twenty Years 1942



DEEP-ROOTED

Roots that grew deep in aviation made possible Ryan aircraft production which today stands as a bulwark against the Axis. Reaching back 20 years, Ryan roots of experience nurtured America's first regularly scheduled passenger airline, provided the early exploration of air mail routes, pioneered the building of monoplanes on a production basis. Then followed sleek, maneuverable, low-wing Ryan S-T primary trainers whose wings have flashed against the skies of twelve friendly foreign countries.

Today the U. S. Army Air Forces and the U. S. Navy use Ryan military trainers in their gigantic programs for producing untold thousands of the world's finest pilots. Now Ryan is on a large scale production program for the Navy. Result will be clouds of Ryan-built scout observation planes to seek out and strike down the enemy at sea. Thus Ryan roots grow ever deeper in aviation — and deeper in the service of the nation.

RYAN AERONAUTICAL COMPANY — SAN DIEGO, CALIFORNIA
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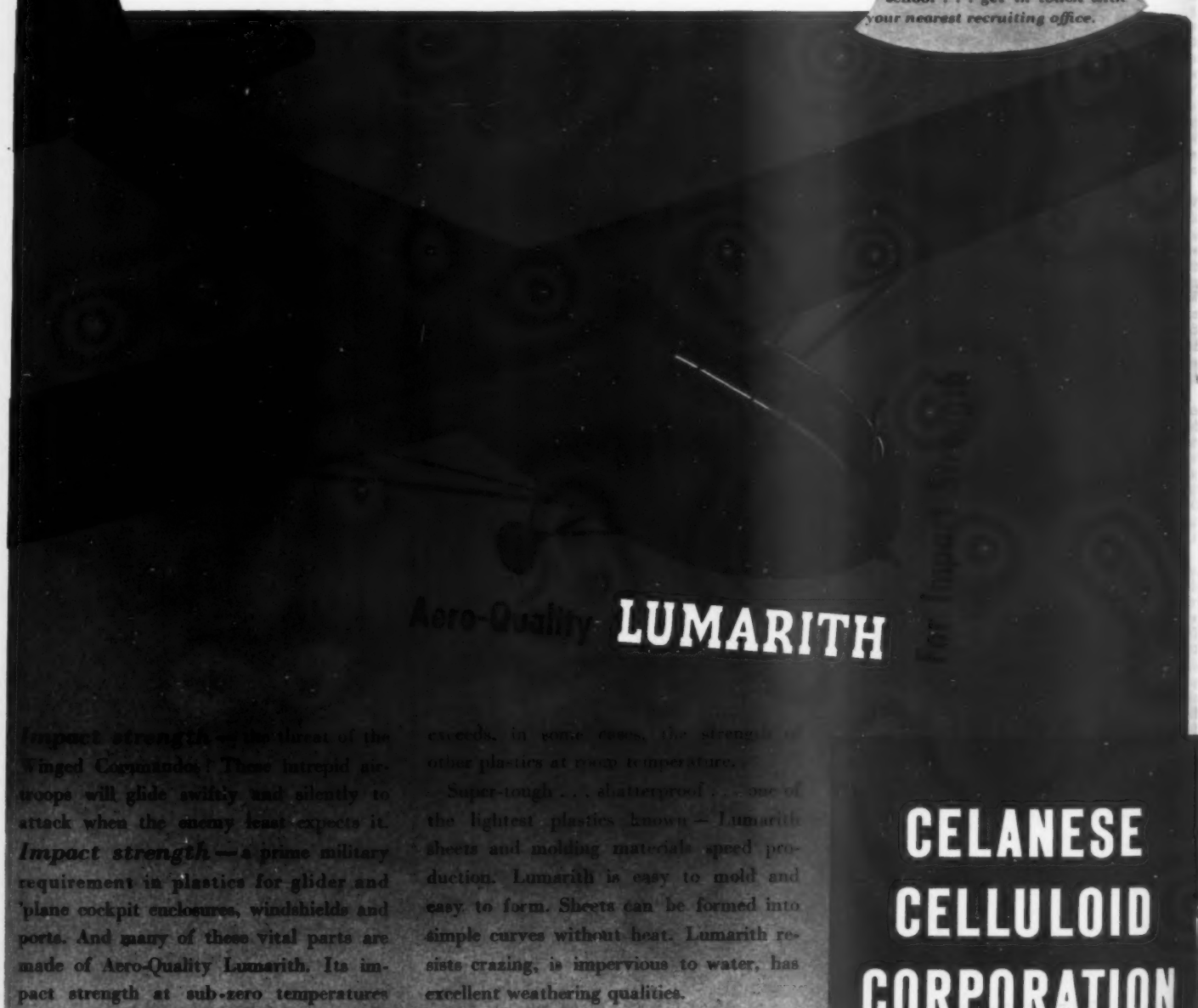

Aero-Quality LUMARITH

Impact strength is the threat of the Winged Commandos! These intrepid air-troops will glide swiftly and silently to attack when the enemy least expects it. ***Impact strength*** — a prime military requirement in plastics for glider and 'plane cockpit enclosures, windshields and ports. And many of these vital parts are made of Aero-Quality Lumarith. Its impact strength at sub-zero temperatures exceeds, in some cases, the strength of other plastics at room temperature.

Super-tough . . . shatterproof . . . one of the lightest plastics known — Lumarith sheets and molding materials speed production. Lumarith is easy to mold and easy to form. Sheets can be formed into simple curves without heat. Lumarith resists crazing, is impervious to water, has excellent weathering qualities.

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Northrop Reports $3,044,741 Net

In an extensive report to stockholders, Northrop Aircraft, Inc., Hawthorne, Cal., reveals a net profit of $3,044,741 for the fiscal year ended July 31, 1942. Provision of $4,550,000 was made for Federal taxes. This compares with a net loss of $848,778 in the 1941 fiscal year.

Profit in 1942 was realized on sales of $32,983,762, compared to $3,407,704 sales in the fiscal year ended July 31, 1941. Company reports deliveries of $20,000,000 in May, June and July of this year alone.

Northrop has "utilized substantially all of the company's net profits to expand manufacturing facilities and operations to the extent necessary for the Company to do its share of war production," according to LaMotte T. Cohu, chairman of the board. Also, he said, "stockholders' equity has increased from approximately 1¼ million dollars to more than three million dollars . . . This increase has been invested for the most part in fixed assets."

Mr. Cohu revealed further that Northrup is engaged in production of "a new military aircraft," which is expected to be in production within a few months. At the same time, "Experimental work is also progressing on the Northrop Flying Wing," although "benefits . . . may not be fully realized until after the war." This type is believed to have possibilities "for the passenger and freight transports of the future."

In addition to using profits to expand the physical manufacturing facilities of the company, Northrop states as further objectives the building up of an "adequate fund of working capital," and the establishing of "a sound dividend policy." During the war, tax laws will naturally restrict dividend policy, it adds.

Company balance sheet shows total assets as $15,308,969.91, consisting in part of $11,449,495.84 current assets, and $2,939,274.38 in property, plant and equipment. Total current liabilities are $12,407,-911.43, of which $2,432,076.03 is charged to notes payable to bank, and $4,131,383.16 is accounts payable—trade. Paid-in surplus is $349,503.43, and earned surplus is $1,068,053.05.

Shafer Heads New Engineers' Society

Society of Aircraft Industrial Engineers, recently organized and "planned for national scope", has announced election of Clayman C. Shafer to head the Society's first chapter, which includes the entire area of Los Angeles, Cal.

Shafer is a senior industrial engineer at the Southern California plant of Vultee Aircraft, Inc., Vultee Field, Cal. His group, which includes engineers from many of the major West Coast manufacturing plants, proposes to form "a panel of consultants whose combined services will be available to warplane producers seeking closer alignment of their manufacturing systems with urgent demand for faster quality output."

Meetings of this Los Angeles unit will be held monthly. Vice president is Lloyd E. Marsh, of North American Aviation, Inc., Inglewood, Cal. William A. Harker of Vultee, is secretary, and Dick R. Linch of Lockheed Aircraft Corp., Burbank, Cal., is treasurer.

McDonnell Completes Vibration Experiments

"Completion of vibration experiments which may help solve one of aviation's greatest problems—disintegrative flutter at high speeds," was announced Oct. 7 by McDonnell Aircraft Corp., St. Louis, Mo.

"McDonnell has engaged in a series of exhaustive tests," company said. "Using a technique new to aviation, the motion of an airplane wing during flutter was analyzed under controlled conditions simulating dynamic flight with varying weight distributions and speed factors, and results were accurately measured, recorded and photographed simultaneously."

"As a result of this new technique," statement continued, "it is now possible to see, record and measure the flutter of wings and other airplane surfaces, simulating almost any conceivable condition which might be encountered in actual flight. Thus, the flutter characteristics of newly designed aircraft may be analyzed and more accurately predicated prior to actual construction, thereby eliminating much costly full scale experimentation and delay."

Manufacturing Digest

MOTOR PRODUCTS Corp., Detroit, Mich., according to statement by its president, A. L. Lott, has contracts with the U. S. Army, Navy and Army Air Forces, as well as sub-contracts with motor car manufacturers, for whom it formerly produced car parts. Under these it now produces tank parts, airplane parts and airplane engine parts.

AMERICAN CENTRAL MANUFACTURING Corp., Connersville, Ind., announces further expansion of operations, using all space at Connersville for war production. Principal expansion is in production of aircraft parts. The enlarged program will make necessary a large increase in the number of employes and "an accelerated training program."

SOLAR AIRCRAFT Co., San Diego, Cal., is making exhaust manifolds for airplanes in its new plant in Iowa, recently opened. Company reports it recruits most of its welders and metal workers from graduates of defense courses conducted by local schools.

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How to get into Aviation—Now

by C. S. (Casey) Jones

Facts about the opportunities and training now available to those who wish to enter aviation.

What can I do to get into aviation? How can I become a pilot—navigator — bombardier — inspector — aircraft mechanic or engineer? What courses are available and what are the requirements?

C. S. JONES

Questions like these are constantly submitted to my associates and me. This is because our schools have long been engaged in training young men in the mechanical and technical phases of aviation. And, while our two schools are operating at capacity and primarily for the United States Army, we want to be helpful to any and all who seek an aviation career.

• • • •

Many thousands of ambitious and patriotic Americans are eager to get into aviation now. The government, the airlines and the aircraft industry are conducting training courses, in various phases of aviation, to prepare men and women for an early and active part in this industry which is so vital to the country's survival today, and which holds so much promise for the future.

There is a need for spreading information on this subject. Our schools have decided, therefore, to take space in a number of magazines—of which this is one—to answer questions and report facts on job and training opportunities which are now available in aviation. In so doing, we hope to render a service to the public, the aircraft industry and the air forces.

• • • •

Readers are cordially invited to submit questions, which will be answered in this column if of general interest.

• • • •

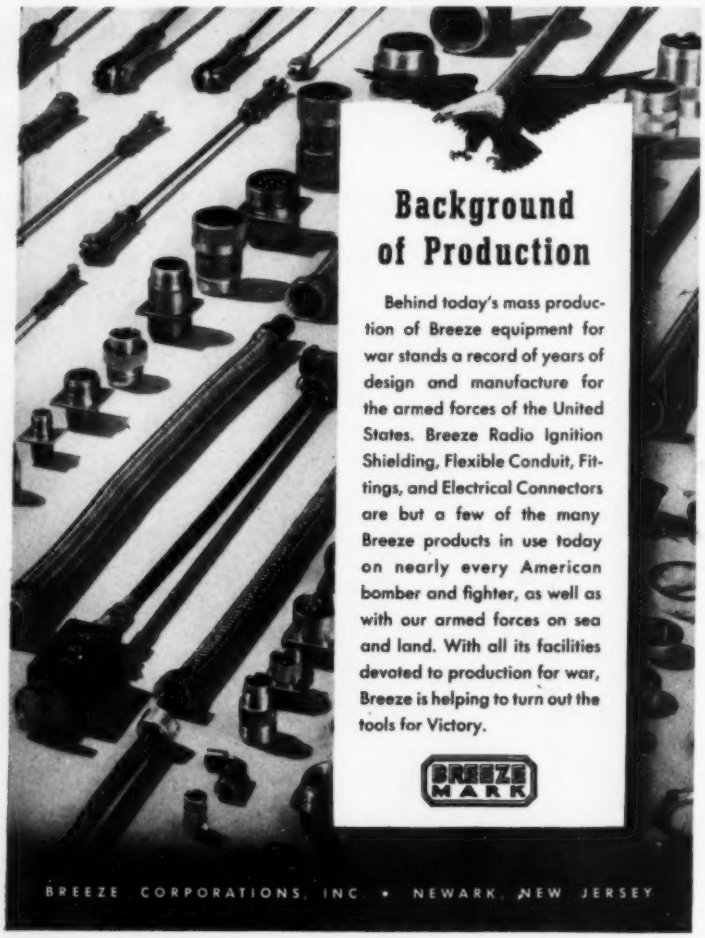
The next column to appear will contain information on the Airlines Training Program.

C. S. Jones
President

ACADEMY OF AERONAUTICS
La Guardia Field, New York City

CASEY JONES SCHOOL OF AERONAUTICS
1100 Raymond Blvd., Newark, N. J.

Training the Key Men of Tomorrow in Aviation



Background of Production

Behind today's mass production of Breeze equipment for war stands a record of years of design and manufacture for the armed forces of the United States. Breeze Radio Ignition Shielding, Flexible Conduit, Fittings, and Electrical Connectors are but a few of the many Breeze products in use today on nearly every American bomber and fighter, as well as with our armed forces on sea and land. With all its facilities devoted to production for war, Breeze is helping to turn out the tools for Victory.

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METEOROLOGY for SHIP and AIRCRAFT OPERATION
by PETER E. KRAGHT, Sr. Meteorologist, American Airlines

Written in straightforward language, this book handles winds and weather with full emphasis on problems of plane and ship operation. Beginning with basic facts about the air, the author continues with horizontal and vertical winds, and their accompanying weather, and a long section on fog and other low clouds. Instead of formulae, 21 practical, easy-to-read tables are presented. Added features are glossaries of winds and technical terms, and an 8-page photographic section of cloud forms.

Especially outstanding are the 155 illustrations prepared by the author which explain and clarify nearly every page of text.

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by CAPTAIN DAVID POLOWE

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Incorporations

Delaware—General Aircraft Products, Inc. Aircraft engines. Capital, $1,000,000. Principal office, the Corporation Trust Co. Incorporators: Judson E. Benjamin, Mt. Vernon, N. Y.; Emil V. Pilz, Ridgewood, N. J., and Gordon G. Frost, Hillsdale, N. J.

Delaware — Langley - Mills Aircraft Corp. Aircraft. 5,000 shares, n.p.v. Principal office, the United States Corporation Co. Incorporators: David H. Jackman, Harry B. Davis and George V. Reilly, New York.

New Jersey—Atlantic Aviation Institute, Inc., Trenton. Aircraft construction education. $125,000. Agent: Allan Whitlock.

New York—Aeronautical Management and Construction Corp., filed by David J. Colton, $20,000.

MINIMUM RATE

Stabilized

$4

Voluntarily, The Lexington stabilized its minimum rate —*in 1939!* It's still $4.00— and more than one-half the total number of rooms in "New York's Friendly Hotel" are now, as before, available at that price...all outside with combination tub and shower, circulating ice-water, full-length mirror, four-station radio. *Home of the famous Hawaiian Room.*

Hotel Lexington

Charles E. Rochester, V. P. & Mng. Dir.

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Eastern AWPC Names Groups

Aircraft manufacturers who recently formed the Aircraft War Production Council, East Coast, Inc., named members of six of seven committees at a meeting held Oct. 12 at the Glenn L. Martin plants near Baltimore.

These committees are as follows: Production, T. B. Soden, Martin, chairman; William F. Wise, Aviation Corp.; L. L. Benson, Bell; W. A. Bates, Brewster; John Lee, Curtiss-Wright; C. S. Swayze, General Motors; Philip Harr, Fairchild and Alfred Marcher, Republic.

Material, Arthur Peck, Republic, chairman; P. E. Garlent, Aviation Corp.; N. T. Shaw, Bell; G. A. Schwoble, Brewster; Frank Maley, Curtiss-Wright; O. C. Mueller, General Motors; O. R. Perkins, Fairchild and T. J. Dunnion, Martin.

Engineering and Standards, E. L. Zivi, Martin, chairman; W. B. Griese, Aviation Corp.; Harlan Poyer, Bell; R. D. MacCart, Brewster; H. E. McDonald, Curtiss-Wright; W. J. Tell, General Motors; Armand Thieblot, Fairchild and Wendell Miller, Republic.

Industrial Relations, D. W. Siemon, Martin, chairman; C. W. Bishop, Aviation Corp.; V. Bell and D. G. Forman, Bell; E. J. Walsh, Brewster; C. S. Mattoon, Curtiss-Wright; R. E. Waldo, General Motors; E. E. Neubig, Fairchild and W. L. Wilson, Republic.

Public Relations, Avery McBee, Martin, chairman; H. P. Harris, Aviation Corp.; F. R. Neely, Bell; R. Hill, Brewster; H. E. Lawrence, Curtiss-Wright; J. N. Bird, General Motors; J. E. Lowes, Jr., Fairchild and T. W. MacDonald, Republic.

Plant Defense, E. T. Adams, General Motors, chairman; S. B. Withington, Aviation Corp.; Paul Grezelle, Bell; H. A. Loughran, Brewster; D. G. Welch, Curtiss-Wright; William Hamby, Fairchild; E. A. Shurman, Martin and Arthur Kelly, Republic.

A service committee was named by the directors to extend intercompany cooperation to service men and planes in the field, but membership in this group was not completed.

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Builds the parts for America's Air-mada

IN a hundred plants scattered over the country, America assembles the air-mada to master the air over every fighting front.

But before the planes (and Victory) must come the parts—wings, fins, tail surfaces, ailerons, stabilizers, fuselage sections, and more.

Fleetwings is building these parts . . . by the hundreds, by the thousands. And Fleetwings is building them faster than they have ever been built before.

To do this, Fleetwings pioneered with new metals, new techniques, new processes. Old methods of fabrication were streamlined, new methods invented.

Although our present production is all for Victory, we haven't forgotten the future. Plans for that future are on Fleetwings drawing boards *now*. With Victory they will be revealed and the pioneering of Fleetwings engineers will add still greater chapters to America's air history.

FLEETWINGS

Incorporated

BRISTOL • PENNSYLVANIA

Air Transport Engineering

(Continued from page 38)

ferring and following up major projects with component sections, may be a solution to this problem.

Now we find ourselves with an organization in which maintenance-engineering is the key. The department is broken down into proper component sections and in each section we have a free-lance development segment. We've provided maintenance - engineering facilities for service troubles analysis, report and follow-up. We've given engineering "service" through liaison organization. But if we stop here, have we fulfilled our requirements for a comprehensive air transport engineering staff? For 1939 operation maybe we have done enough, but we feel there are trends evident to us today, prophetic of the future, that should prompt further rounding out of our group.

Planning Needed

Mass maintenance can only be accomplished by planning. More than maintenance scheduling, this factor in its final form may closely resemble production planning. It will involve aircraft movements, material and component flows, manpower allocation, etc. Its application implies routing techniques, production schedule boards that will indicate progress and work status at a glance, flexible crew organizations and similar details. This planning function appears to play a potential lead role in our air transport operations; its spot in the organization may well be on the engineering staff.

Each of our component sections —powerplants, aircraft, instruments, etc.—provides us with an experimental development engineering source on that specific phase of our activity. They are, in short, specific research groups. Their work serves a two-fold purpose: the immediate solution of current problems requiring experimentation and development, and, no less important, the keeping abreast of specific research outside of our organization, *i.e.*, manufacturers and other airlines, which is applicable to our future.

This latter point is by nature a "tomorrow value"; the former, immediate solutions, are transient in value, lost in passing unless we translate them into specific recommendations and requirements for the future. Here, then, is another phase of our work that must be covered: the consolidation of all development engineering, the collective product of all of our component development groups.

An applied research section might be the proper designation for the group so occupied. A sound aerodynamicist would be a valuable asset to such a group. The function of the group could be bi-directional, a give and take proposition. Further than just analyzing, defining and setting forth the development from within, they should circulate throughout the industry, manufacturing and transport, feeding back to the specific development groups data on developments for study and recommendations. From these activities would grow a "future aircraft requirements" group which would carry through basic and detail design specs and in cooperation with the planning group could time-specify secondary design as suggested last issue in these columns.

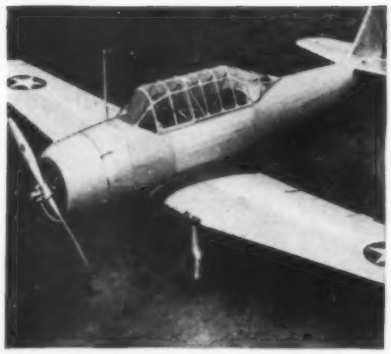
Engineering research and planning can assure our future designs of being transportation vehicles. Planning must incorporate into its scope of activity the production layout of our shops, equipment specifications, provision for needed future productive capacity, etc.

But there's one final important function which we feel necessary for our overall maintenance engineering picture. It is economic engineering research; at least that's what we call it. Our definition of the economic engineering phase may be best presented by illustrating a few of the problems we would assign to such a group: the determination of the value of air sorting of express; the specific power conditions and flight attitude essential for getting the most carried in the least time; the determination of economic criteria for application to future design; the dollar per passenger mile and per ton mile operating costs of a "C-98" converted to full passenger carrying or otherwise varied to adapt it to special services; the aircraft and cargo handling facilities and equipment essential to a specific operation; the engineering-maintenance problems encountered in the large scale shipment of a certain commodity, etc.

Three Factors

All of these problems have three things in common: engineering factors, economic considerations and bearing upon other phases of air transport than engineering. They are joint problems which must be solved and if in our solution we ignore the engineering phase we may be doomed to disappointment. We think it better to assign the entire problem to the engineering group; to assure that all interested departments' opinions are incorporated in the study and to apportion responsibility to engineering for the final effective recommendations and solution. Hardly an original or novel field of activity, this, and recent correspondence with the airlines prompts us to wonder just how much of this work is presently being done in a formal effective manner. Dix Speas, Research Engineer of American Airlines, we know to be very hard at it and doing an excellent job.

FLEETWINGS
pioneers with parts and hydraulic equipment



The BT-12, all-welded basic trainer built for the U. S. Army Air Forces.

TO "KEEP 'EM FLYING"—In addition to building myriad aircraft parts for other manufacturers, Fleetwings also builds *complete* planes. The Fleetwings-designed-and-built BT-12 has more than proved the mettle of stainless steel for military aircraft. (Incidentally, the BT-12 is the *first* all-welded military plane constructed principally of stainless steel.)

LEAVE IT TO FLEETWINGS—to give a new "twist" to the nation's scrap-saving program. In the Fleetwings plants, there's an active campaign *to keep scrap from becoming scrap!* Vital plane hardware—nuts, bolts, rivets, clecos, and washers—is being conserved through a company-wide program which stresses that "every rivet is a bullet" and that plane hardware should be treated as though it were rationed ammunition—and not to be left where dropped.

OVER 1100 HOURS—were saved on a recent job at Fleetwings through the use of a new and simplified Template Reproduction Process. Another example of how Fleetwings is speeding plane and plane parts production.

ANOTHER FLEETWINGS ADVANCE—is the use of isometric, three-dimensional graphic illustrations along assembly lines to speed and facilitate production of airplane surfaces. These graphic illustrations, made in our Tool Design Department, show the exact position and procedure for every nut, bolt, rivet, washer, etc. and greatly simplify assembly work for men with little or no training in the reading of blueprints.

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Inquiries invited from schools needing instructors in Navigation and Meteorology or Aircraft and Engines. All Airport Ground School graduates of these instructor courses also have supplementary training in Instruments, Parachutes and C.A.R. plus many hours of practical teaching. For details, write to Placement Bureau of:

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Goodyear Constructs Arizona Blimp Plant

Construction of a new blimp assembly plant in Arizona has been announced by the Goodyear Aircraft Corp., Akron, O. Plans call for building the plant large enough to "permit assembly of a number of K-type patrol ships simultaneously," company stated.

Production of K-ships, "though . . . larger and more complicated to build" than the B type designed 25 years ago, is believed to be well ahead of the World War I schedule.

Goodyear added that it has a new building for construction of airship cars, though it did not specify its location. It permits "for the first time a modern assembly line for car construction." Company has sub-contracted with Twin Coach Co., Kent, O., and the Flexible Co., Loudonville, O., for additional airship cars.

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Manufacturing Personnel

Duggan Conlee Spencer Bern

Edward G. Bern, formerly regional vice-president of American Airlines Inc., has been appointed sales manager of Hughes Aircraft Co., Culver City, Cal.

Robert D. Spencer, formerly in design work with McDonnell Aircraft Corp., St. Louis, Mo., has been named manager of aeronautical sales and engineering at The General Tire and Rubber Co., Akron, O. He will direct all aviation tire design and engineering.

Tom O. Duggan has been elected a vice president of Thompson Products Inc., Cleveland, O. He continues as general manager of the service division, a position he has held since 1936.

Jack Frost, executive secretary of the Aircraft Parts Manufacturers Association, Los Angeles, Cal., has resigned to join the armed forces. The Association has as yet named no successor.

George Conlee has been appointed engineering-sales representative for the Fleetwings hydraulics division of Fleetwings, Inc., Bristol, Pa.

Whitney C. Collins was appointed vice president in charge of sales policy, Elastic Stop Nut Corp., Union, N. J. He has been a director of the firm since 1940.

C. P. Shropshire, traffic manager at the Nashville division, Vultee Aircraft, Inc., for the past two years, is now Deputy Director of Traffic and Transportation for the AAF, and is located at the Washington, D. C., headquarters. He is on temporary leave of absence from Vultee.

Retiring as director of Aviation Corp., **Tom M. Girdler** will be available as consultant to the company and will continue as chairman of the boards of Republic Steel Corp., Vultee Aircraft Inc., and Consolidated Aircraft Corp. Succeeding him on the board of Aviation Corp. is Col. **Arthur W. Herrington,** chairman of the Marmon-Herrington Co., of Indianapolis.

With the Los Angeles Chamber of Commerce in the transportation department for 18 years, **Harry R. Brashear,** well known traffic expert has joined the staff of the Aeronautical Chamber of Commerce, Inc., Washington, D. C., to organize a traffic department, which will coordinate traffic departments in the aircraft industry in loading, shipping and other practices.

Appointed vice president in charge of all corporation engineering, **Charles Marcus,** former group executive, eastern division, is among executive changes at Bendix Aviation Corp. **D. O. Thomas,** former western group executive, becomes vice president of manufacturing in all the firm's plants. **Malcolm P. Ferguson** goes from general manager of the South Bend plant to Thomas' former position. **T. W. Tinkham,** former factory manager, succeeds Ferguson. **William L. McGrath** continues as vice president of the corporation and general manager of the Elmira, N. Y. division. Successor to Marcus' former position is **Raymond P. Lansing.** Others: At Bendix, N. J., **Arthur E. Raabe,** former sales manager, is upped to assistant general manager, along with **Kennedy MacGrath,** who has the same title. At Baltimore, **Hugh Benet** is the new general manager; **N. B. McLean** goes to the same position in the Philadelphia plant, and **G. W. Smith** holds similar title in the Marine division plants at Brooklyn and Norwood, Mass. **A. A. Kucher** is director of research at Detroit.

★ Franklin
FINE AIRCRAFT ENGINES
★ AIRCOOLED MOTORS CORP., SYRACUSE, N. Y.

"Guns" That Shoot 3000 Miles—!

Today, in ever-increasing numbers, America is building "guns" that shoot *4 tons* of projectile more than 3000 miles.

These "guns" are the huge, four-motored Consolidated Liberators (B-24's)—the first heavy bombers ever to be built on a moving assembly line. The Liberators can reach any front in the world under their own power and *are doing so every day.*

The thousands of employees of the Consolidated Aircraft Corporation who build the Liberators, Catalinas, and Coronados, are *buying* them for Uncle Sam, too. They consider the money they invest in War Bonds as their own personal contribution toward a fitting reception for the "new order."

Consolidated Aircraft Corporation, San Diego, California. Member, Aircraft War Production Council, Inc.

He mistook . . .

FOR FERDINAND FUTTS PLEASE LIGHT UP A CANDLE,
HE MISTOOK THE FLAP FOR THE LANDING GEAR HANDLE;
HE OVERSHOT, UPPED WHAT HE THOUGHT WAS THE GEAR,
BUT FOLDED HIS FLAPS AND FELL IN ON HIS EAR.

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CONSOLIDATED* builds Battleships of the Air

*Originator of the LIBERATOR . . . CATALINA . . . CORONADO

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Financial Briefs

BENDIX AVIATION Corp., South Bend, Ind., reports from its Detroit office that dividend action, scheduled for Oct. 28, will be postponed until Nov. 24. Reason stated is to give directors time to evaluate tax developments.

BEECH AIRCRAFT Corp., Wichita, Kan., directors on Oct. 8 declared a $1.00 dividend, first in the company's history, payable Oct. 27 to holders of record Oct. 17.

MENASCO MANUFACTURING Co., Burbank, Cal., report for fiscal year ended June 30, 1942 shows net profit of $334,692, after provision for Federal taxes of $726,000. Profit is equal to 36c each on the 925,000 shares outstanding. Sales for the year were $4,869,695, "more than double the sales for the previous fiscal year." Net profit from operations was $1,490,967, against $307,667 for the previous year.

EX-CELL-O Corp., Detroit, Mich., reports, for the nine months ended Aug. 31, 1942, net profit of $2,523,572, equal to $6.33 each on 398,806 shares of common. A reserve of $10,994,288 was set up for Federal income and excess profits taxes. There is no comparison with the 1941 period, because of a change in the fiscal year.

MICROMATIC HONE Corp., Detroit, Mich., report to stockholders for seven months ended July 31, 1942, shows net profit of $71,671, after provision of $438,000 for Federal taxes, and deductions for depreciation and interest. Profit is equal to 56 cents each on 127,335 shares, common. Because the company changed its operating basis from a calendar year to a fiscal year, no comparisons with previous periods are possible.

Contractors to the United States Army, Navy and Coast Guard and Aircraft Engine Builders.

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On the Labor Front

AERO-PRODUCTS CO., GMC., Dayton, O.
Employes in an NLRB election voted for UAW-CIO as bargaining represent
AMERICAN PROPELLER CORP., Toledo, O.
In separate elections conducted for toolroom, and other production and ma tenance workers on September 15, both groups voted in favor of UAW-CIO representation.
BENDIX AVIATION CORP., Bendix Products Division, South Bend, Ind.
NLRB has certified UAW-CIO as collective bargaining agent for employe result of election held Sept. 24.
BOHN ALUMINUM AND BRASS CORP., Detroit, Mich.
Dispute with UAW-CIO workers concerning wages is certified to NWLB.
CURTISS-WRIGHT CORP., Caldwell, N. J., plant.
Controversy is certified to NWLB. Issues are: wages, union security, vacati and grievance procedure.
FAIRCHILD AVIATION CORP., Jamaica, L. I., N. Y.
NLRB has notified the company of certification of UER&M-CIO as bargain agent for service employes.
FAIRCHILD AIRCRAFT DIVISION, Hagerstown, Md.
Dispute with UAW-CIO workers over wage rates is certified to NWLB.
FEDERAL BEARINGS CO., AND SCHATZ MFG. CO., Poughkeepsie, N. Y.
Case involving issues raised by recent strike is certified to NWLB.
FORD MOTOR CO., Detroit, Mich.
NWLB decision has refused employes' demands for $1-a-day wage increa stating that workers had received 25% to 28% increase in straight hour rate since Jan. 1, 1941. ("Little Steel" formula is based on increases less the 15% since Jan. 1, 1941.)
GENERAL CABLE CO., St. Louis, Mo., plant.
NLRB has ordered and company has agreed that it will not dominate or in terfere with administration of Cable Craft Union, or promote AFL or any oth labor organization, or prevent employes from joining or assisting USW-CIO.
GOODYEAR AIRCRAFT CORP., Akron, O.
Plant at Litchfield, Ariz., employes vote for IAM-AFL as collective bargain representatives.
INTERCONTINENT AIRCRAFT CORP., Miami, Fla.
Company reports that it has signed a new collective bargaining contract wit IAM-AFL to be effective as of Aug. 1, subject to approval by NWLB. Agreeme raises beginners' pay and provides other wage increases and 80-hour vacation sick leave to workers with one year seniority.
KROEHLER-DOAK AIRCRAFT PARTS DIVISION.
Employes have petitioned NLRB to hold an election for selection of bargain agent.
GLENN L. MARTIN CO., Baltimore, Md.
Company has increased the hourly base pay rates of its employes to compe sate them for the loss sustained in weekly wage rates due to the President order banning premium pay for weekend and holiday work.
NORTH AMERICAN AVIATION, INC., Inglewood, Cal.
Company is directed by NLRB to bargain collectively with local of UAW-CIO
STANDARD TOOL CO., Cleveland, O.
NWLB has granted employes a wage increase of 5½c an hour, retroactive t June 8.
TOOL & DIE WORKERS, Detroit, Mich.
A 10c-an-hour wage increase has been made by NWLB to 30,000 tool an die makers in the "captive shops" of the three major automobile manufacturer but Board denied a general wage increase to 5000 employes in the 80 too and die job shops in the city.
WRIGHT AERONAUTICAL CORP., Paterson, N. J.
Cyril D. Savage, president of the disestablished Wright Aeronautical Employe Association, asserted that NLRB is seeking to destroy all independent union

Noorduyn Explains Attitude on Bonus

Noorduyn Aviation Ltd., Montreal, Que., has corrected the interpretation previously placed on the attitude of Noorduyn, Canadian Vickers and Fairchild Aircraft Ltd. toward the application for increased cost-of-living bonus by the International Association of Machinists.

Press reports had erroneously stated that the companies opposed the bonus. However, Noorduyn asserts that a "correct description of the situation" follows:

"An application by Local Lodge 712, International Association of Machinists, made to the Regional War Labour Board for the Province of Quebec, for increased basic wages and an increase in the cost-of-living bonus for hourly paid employes in the plants of Noorduyn Aviation Ltd., Canadian Vickers Ltd. and Fairchild Aircraft Ltd., was refused by the Board.

"The matter arose out of the negotiations for renewal of the existing contract between the Lodge and these companies. The companies had taken the standpoint, w which the Lodge took no exceptio that the matter was outside the jurisdiction, as the cost-of-livin bonus being paid is fixed by the law and increases in basic wage prohibited under Order-in-Council 8253. Application to the Regiona Board by the employes' representa tives was the only course open t them.

"No question of approval or op position by the companies was in volved, and they refrained from expressing either. Escalator clause in all contracts fully protect the contractors from the effects of an increase in wages and/or cost-of-living bonus."

Classified Ads

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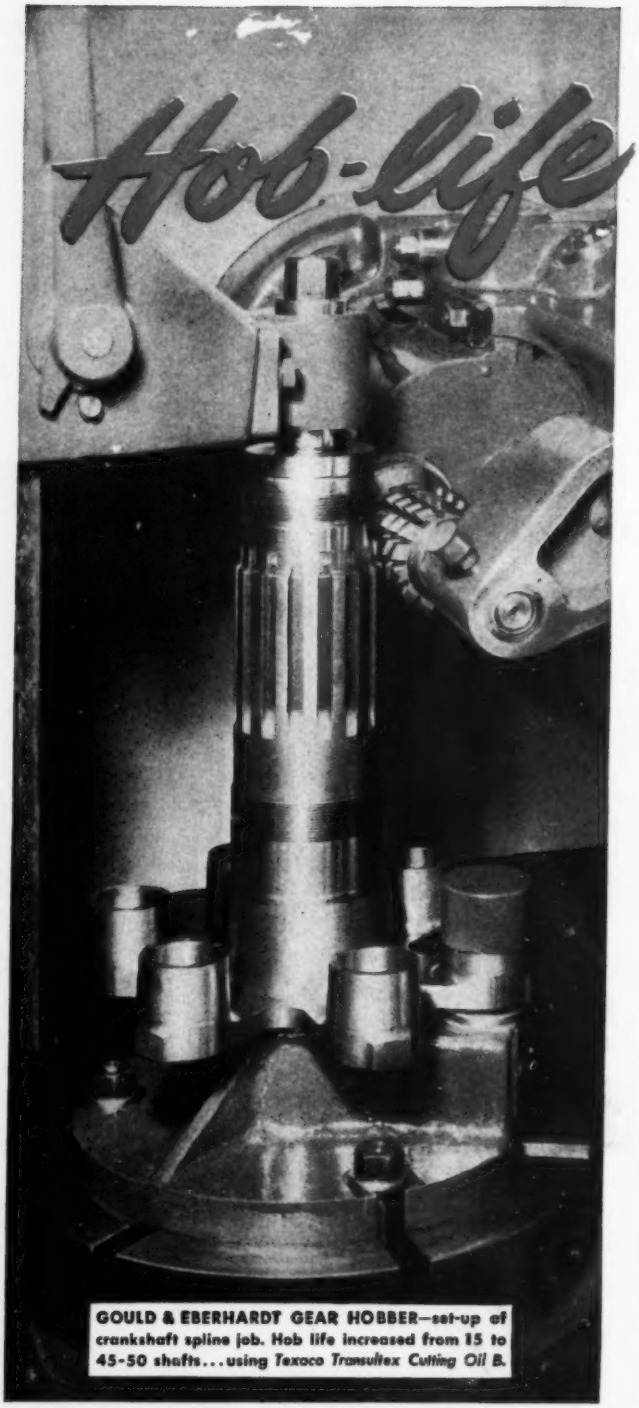

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